Review Environmental Assessment and Assessment of Effect

For the Preservation of Civil War Earthen

Fortifications at Petersburg National Battlefield

Fort Friend

Fort Haskell

Colquitt's Salient

Elliott's Salient

Fort Urmston

Fort Conahey

Fort Fisher

Battery 27

Fort Welch

Fort Gregg (Union)

Fort Wheaton

August 2, 2001

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Chapter 1 Purpose and Need for Action

Introduction

In anticipation that Petersburg would prove of major importance in Union General Ulysses S. Grant's plan to cut off Richmond from its supply lines, two demonstrations were made against the city. Carried on by Union General Benjamin Butler's Army of the James, on May 9, 1864, Federal troops moved upon the city from the north in an attempt to cut the Richmond & Petersburg Railroad. They were stopped by Confederate defenders at nearby Swift Creek.

A month later, on June 9, Butler sent another force of combined infantry and cavalry to move into Petersburg from the south and east. This time only a small force of Southern regulars and local citizens were available to stop this threat. This band of "Old Men and Young Boys" successfully held off the Union cavalry until reinforcements under Confederate General G.T. Beaureguard arrived on the scene.

Six days later, from June 15 –18, Grant began a series of frontal assaults on the city from the east after successfully crossing the Army of the Potomac over the James River from the Cold Harbor battlefield. Once Lee finally arrived with his entire Army of Northern Virginia, the city and its all important supply lines were now saved. With both sides losing close to 15,000 casualties in the four-day struggle, siege operations then began against Petersburg. This campaign would then be spread out over the next nine-and-one-half months where the combatants would use trench warfare tactics later refined and deployed during World War I.

The Union and Confederate soldiers built earthen fortifications for their protection surrounding the city of Petersburg (Figure 1). These forts, salients, and batteries were strategically placed on the landscape. They were engineering marvels of their day containing elements not duplicated elsewhere. The earthen fortifications are composed of soil dug from an area (moat) and piled up to heights of up to 15 feet behind the moat. Forts are enclosed structures while salients and batteries are elongated mounds of soil. These fortifications were developed, maintained, and lived in by almost 200,000 soldiers.

In the main unit of Petersburg National Battlefield, four fortifications played vital roles in key military actions. Fort Friend, Fort Haskell and Colquitt's Salient were part of Lee's last offensive. Colquitt's Salient was the launching point for the attack, and the capture of Forts Friend and Haskell was the objective. Elliott's Salient was the Confederate earthwork that was the target of a Union mining operation that resulted in the battle of the "Crater".

Seven forts of the Union forces' "fish hook" six miles to the west were additions to Grant's tightening noose around Petersburg. NPS staff later named these series of entrenchments for the fishhook shape. Each served as an independent segment of the line. Fort Fisher was the largest of the fortifications built during the 292 days of military activity. These fortifications provided a defensive position against attack and were the

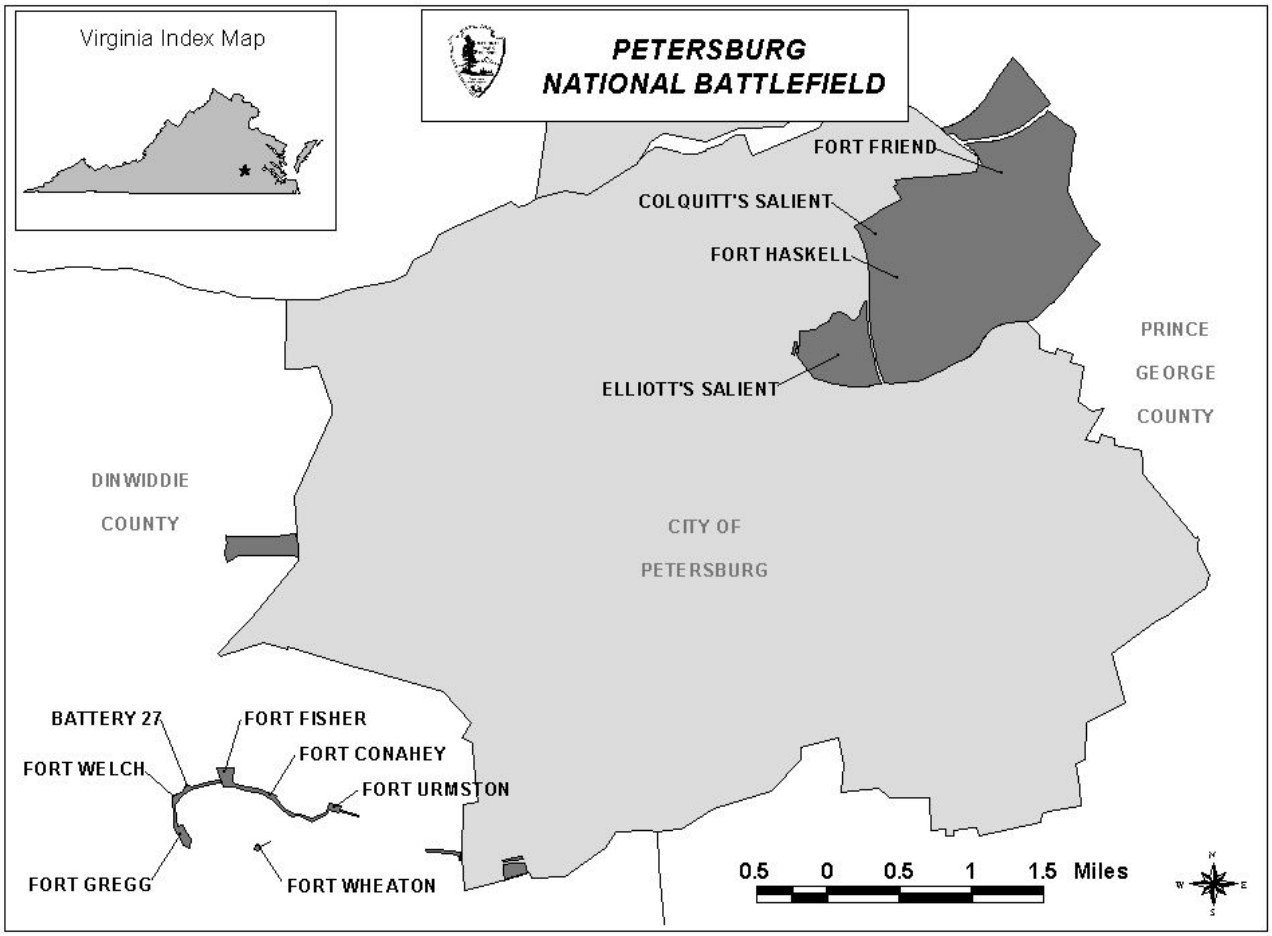
launching point for Union operations against the Confederate right flank, including the final assaults which forced Lee to abandon Petersburg.

Following the Petersburg Campaign, building materials and metals were salvaged, fortifications were leveled, and ditches filled as landowners reclaimed their land. In many cases this resulted in the removal of all traces of an earthwork. In 1926, Congress recognized the importance of preserving elements of the Petersburg Campaign and established Petersburg National Military Park. Preservation of earthen fortifications was established as a primary objective of Petersburg National Military Park with the passage of its enabling legislation that stated:

> *"In order to commemorate the campaign and siege and defense of Petersburg, Virginia, in 1864 and 1865 and to preserve for historical purposes the breastworks, earthworks, walls and other defenses or shelters used by the armies therein, the battle fields at Petersburg, in the State of Virginia, are declared a national battlefield."*

Figure 1

Locations of Petersburg National Battlefield, Virginia, and 11 Civil War Fortifications Proposed for Management



Background

Unlike today where the park is encompassed by a rural/suburban landscape, period (ca. 1865) photographs show very little woody vegetation anywhere near the major earthworks. During the siege, trees were cut for the building of huts and fortifications as well as for cooking fires and fireplaces. In the years following the Civil War, the area

around the seven Fishhook fortifications reverted to secondary forest and remains so today. The vegetative cover in the four Main Unit fortifications has been maintained over the years in grass with a scattering of large, mature trees. Although protected from land use changes and vandalism by the NPS, natural forces including soil erosion, natural tree mortality, and tree windthrow continue to degrade these earthen fortifications. Tree windthrow, in particular, can damage the earthen structure by displacing large areas of soil, crushing historic features, and removing archeological resources from their site. Forest cover also provides concealment for illegal relic hunters that dig into the earthworks to steal archeological resources.

Observations of the park's fortifications over the years have revealed several consequences of forest cover. Tree leaves intercept and slow raindrops and tree roots help to hold soils in place resulting in reduced soil erosion. Trees also provide a ground cover of leaf litter that protects the forest floor from erosion, although fortifications with steeply sloped mounds do not hold the necessary leaf cover. A disadvantage to tree cover is that storm events periodically causes larger trees to uproot. This dislodges archeological artifacts and exposes tons of soil, the historic resource, to rapid erosion by wind and rain. Major storms in April 1998 and March 1999 resulted in significant damage to two fortifications. In addition, limbs and tree trunks periodically fall and damage the earthen structure. Most of the trees on the 11 fortifications are mature which makes them more prone to wind throw and natural mortality. Petersburg National Battlefield expends up to $20,000 annually to rehabilitate the earthworks from damage caused by tree windthrow/mortality.

Historically, the National Park Service has used different vegetative cover types to protect earthworks. Site specific objectives such as visibility and the importance of the particular earthwork to the story being told influences the type of vegetative protection selected (see Management Concerns Section, forest versus grass/herbaceous cover). Forest cover impairs the ability of the visitor to see, and therefore understand the events that occurred at that site. The trees hinder visitor understanding of the size, location, line-of-sight, and inter-relationships of the earthworks in a comprehensive defensive scheme. Fortifications with grass cover are more easily viewed and provide better opportunities for comprehension of the historic events.

Providing physical as well as visual access is an important goal of the park. Experience has shown, however, that visitor movements must be controlled to protect the historic resource since visitors can create unauthorized trails on the earthworks, causing erosion. Controlling visitor movements has been accomplished through developing designated pathways or permitting tall grass to grow on the earthworks where visitor access should be restricted. In Petersburg National Battlefield, unauthorized trails have been established on top of the fortification walls that remain in forest cover because visitors gravitate to the high areas to get a better view and comprehension of the fortification.

Purpose and Need

The purpose of this environmental assessment (EA) is to examine the resource impacts that could result from management practices intended to enhance interpretive and visitor experience opportunities and to preserve significant Civil War fortifications. This EA assesses the most appropriate management alternative for Petersburg National Battlefield.

There are three immediate needs for this action:

- improve the condition and presentation/appearance of the fortifications;
- improve visitor accessibility, visibility, and understanding of the interrelationship of the fortifications;
- reduce the damage caused by tree windthrow and mortality on the fortifications.

This EA examines management alternatives to meet these needs, evaluates each alternative's effectiveness in meeting interpretive and resource protection goals, and determines the environmental impacts of implementing each alternative. The alternative selected by this process is specific to the management situation and site conditions at Petersburg National Battlefield. Other parks responsible for protecting fortifications or earthen structures have different management considerations and, therefore, would select the alternative appropriate for their situation and site conditions.

Legal Compliance and Planning History

The NPS is mandated to preserve and protect its cultural resources through the Organic Act of 1916, Antiquities Act of 1906, National Historic Preservation Act of 1966, Archeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Cultural resources management is also guided by the Advisory Council on Historic Preservation's implementing regulations regarding "Protection of Historic Properties", the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (1995), *Guidelines for the Treatment of Cultural Landscapes* (1996), Chapter V of the National Park Service's *Management Policies 2001*, the National Park Service's *Cultural Resources Management Guideline* (1997) and Director's Order 28 Cultural Resource Management (1998). All proposed undertakings with the potential to affect cultural resources were reviewed in accordance with the National Historic Preservation Act of 1966, as amended, and the 1995 Programmatic Agreement among the NPS, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation. In accordance with Section 106 of the National Historic Preservation Act, the NPS will consult with the Virginia Department of Historic Resources and the Advisory Council on Historic Preservation.

The National Environmental Policy Act (NEPA) of 1969 and Council of Environmental Quality Regulations, as amended, require an environmental analysis of alternatives to determine if any anticipated federal action would have a significant impact on the quality

of the environment. NPS actions that have the potential for affecting water quality must comply with the Federal Water Pollution Act, Clean Water Act, Interagency Chesapeake Bay Agreement, Executive Order 11988 Floodplains, and Executive Order 11990 Protection of Wetlands. Executive Order 13112 Invasive Species restricts introductions by Federal agencies of invasive species into natural ecosystems. National Park Service's *Management Policies 2001*, *Natural Resources Management Guideline* (NPS 77, 1991), and *Wetland Protection Procedural Manual* (Directors Order #77-1) provide further instruction for natural resource management. Consultation with the U.S. Fish and Wildlife Service and the Virginia Division of Natural Heritage ensured that NPS actions do not jeopardize the continued existence of listed species or critical habitat as required by the Endangered Species Act, Virginia Endangered Species Act, and the Virginia Endangered Plant and Insect Act. The U.S. Army Corps of Engineers was consulted for verification of jurisdictional waters and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) was consulted to ascertain water resources in general.

This EA is consistent with the park's Statement for Management (1994), Resource Management Plan (1999) and Interpretive Plan for Units of Eastern and Western Fronts (2000). These documents recognize that interpretation and cultural preservation are priorities for the park. Goals for the preservation and protection of the historic earthworks, shelters, and other defenses are described in each plan. The need to provide the visitor with the opportunity to understand and appreciate the historic scene and the story of the siege is a major objective. The existing Master Plan (1965) for the park does not recognize the threats to the fortifications, however, major emphasis is placed on the goals and options for interpretation and fortification preservation in the General Management Plan currently in development. This EA takes into account the recommendations of the Cultural Landscape Report prepared for the Fishhook fortifications of Forts Urmston, Conahey, Fisher, Welch, Gregg, Wheaton, and Battery 27 (Olmsted Center for Landscape Preservation, 1999). This report provided a survey of the historic development and existing conditions of the surviving "Long Flank" and "Fish Hook" fortifications, identified the major threats to these structures, and recommended a preferred alternative for their treatment.

Project planning included a review of the most specific and recent guidance on earthwork management. The *Guide to Sustainable Earthworks Management* (NPS, Draft) lists three general principles that will be followed to address protection, sustainability, and interpretation of earthworks:

1. Historic earthworks are protected and preserved.

2. Historic earthworks are managed using sustainable practices that consider the associated ecological system.

3. Historic earthworks that are presented to the public are legible [more discernible].

The guide further describes three major management components embodied in the principles of earthwork preservation/protection:

a. Perpetuate and/or establish a vegetative cover that stabilizes the soil and protects the earthworks from direct impacts of wind and water erosion;

b. Minimize the impact of human activities on the earthworks, whether they result from recreational, interpretive, or actual landscape maintenance and management activities;

c. Minimize the deleterious action of natural phenomena on the earthworks, e.g., windthrow of trees, burrowing of animals, or invasion of plant species that reduce natural diversity and erosion-controlling cover.

Management Concerns

Native, non-native, and invasive species

The NPS advocates the use of native species except in rare cases in accordance with NPS *Management Policies 2001* Chapter 4. Invasive species are defined as alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. The NPS follows Executive Order 13112 Invasive Species to the maximum extent practicable which states that the benefits of an action likely to cause or promote the introduction or spread of an invasive species must clearly outweigh the potential harm caused by the invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the action.

Past experience has shown that when all large trees are removed from earthen structures, the leaf litter eventually blows away, washes, and decomposes exposing the soils to potential erosion (Lowe 1998). The transition from canopy/leaf litter to grass cover must occur quickly and completely to protect the soils. Non-native (exotic or alien) grass species (i.e., tall fescue, *Festuca elatior*) has been effectively used in this park since the 1970's to rapidly re-vegetate and stabilize soils on steep slopes of earthen structures. This more easily established grass cover then serves as a "nursery" crop holding subsequent seeding of the more difficult to establish native seed species in place so it has more opportunity to germinate. Petersburg National Battlefield staff would continue to use the seed or seed mixes currently in use for similar projects as these seed mixes have shown they have not caused harm to the environment. Monitoring of the seed used for the last eight years (i.e. tall fescue) has revealed that after initial seeding native vegetation will infiltrate the sites. Seed mix field tests may be conducted as part of an adaptive management program if time and funding permit. The NPS Development Advisory Board has approved the project subject to its review of the proposed grass cover.

Sustainability and maintainability

Sustainable practices meet the needs of the present without impairing the ability of future generations to meet their needs. Sustainable practices reduce resource consumption, minimize threats to the environment, and enhance regional ecosystems while meeting park management objectives. Maintainability, in this case, is the ability of the park to maintain and preserve the historic fortifications. For example, maintaining grass cover requires park resources such as equipment and staff time. Managing forest cover has costs associated with pruning and removing of trees. Both alternatives are active management alternatives that require increased contact with the historic earthen fortifications. A commitment to sustainability and maintainability accompanies this EA.

Monitoring

Monitoring is necessary to determine the effectiveness of the treatments through evaluation of the condition of the resources. The park would establish a monitoring program to track the impacts of their management actions if an alternative requiring management action was selected. A monitoring plan would be designed to evaluate changes in the natural and cultural resources and establish thresholds for management intervention or alterations. Modeling would be performed for example, as permitted by the availability of funds, to determine impacts by monitoring erosion rates for various cover types under field conditions. Adapting subsequent management as necessary (adaptive management) best ensures preservation of the fortifications. An example would be changing the grass seed mix used on the fortifications based on field trial analysis.

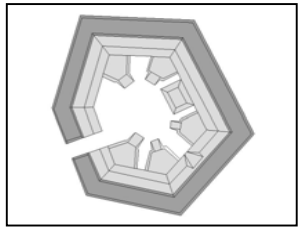
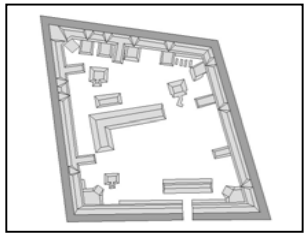
Forest versus grass/herbaceous cover

Rates of soil loss on earthen structures under natural conditions have been examined by researchers (Ambrose 1976; Andropogon Associates 1989; Johnson 1998), and park managers (Petersburg National Battlefield, Richmond National Battlefield Park, and Stones River National Battlefield). Forest and grass cover may do equally well in preventing soil erosion on earthen structures if the vegetation is thriving and well maintained. In the natural environment, however, many variables (e.g., drought, disease) affect the ability to maintain a healthy woodland or mat of thick herbaceous vegetation through time. Long-term monitoring programs using precise measuring tools to determine the most appropriate cover type for long-term (100+ years) preservation of earthen structures have only recently been established at other sites. Results from monitoring and similar research will inform managers on the best cover types to use. Management practices will adapt (Adaptive Management) as results of the monitoring become available.

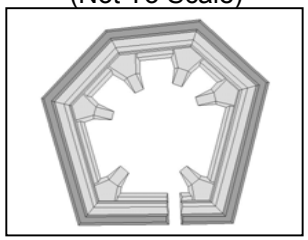
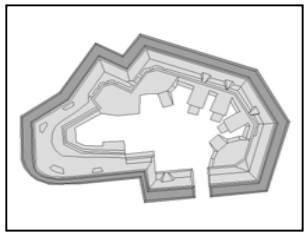
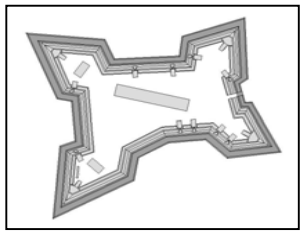
Chapter 2 Alternatives

Description of Alternatives

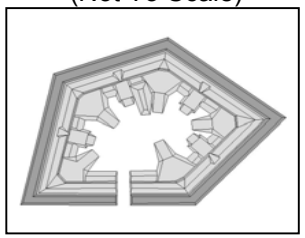
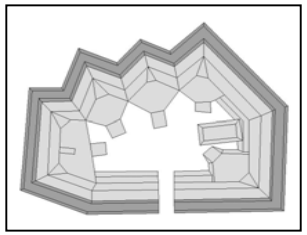
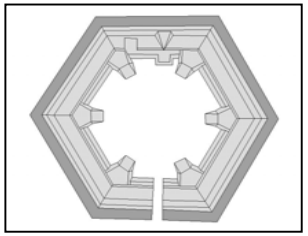
Table 1. Comparison of Alternatives

UNIT	FORT	IMAGE	ACREAGE	CURRENT CONDITION	ALTERNATIVES				
					1	2	3	4*	5
Main Unit		(Not To Scale)							
	Fort Friend		0.64	Tall Grass Understory with Large Trees	A	B	B	B	D
	Colquitt's Salient	(No Engineers Drawing Available)	6.55	Tall Grass Understory with Large Trees	A	B	B	B	D
	Fort Haskell		1.62	Tall Grass Understory with Large Trees	A	B	B	B	D
	Elliott's Salient	(No Engineers Drawing Available)	0.19	Tall Grass Understory with Large Trees	A	C	C	C	D

*** Preferred Alternative**

UNIT	*FORT*	*IMAGE*	*ACREAGE*	*CURRENT CONDITION*	*ALTERNATIVES*				
					1	**2**	**3**	**4***	**5**
Fishhook		(Not To Scale)							
	Fort Urmston		0.42	Small Herbaceous Understory with Mature Forest Canopy	A	D	D	D	D
	Fort Conahey		0.51	Small Herbaceous Understory	A	B	B	B	D
	Fort Fisher		4.41	Small Herbaceous Understory with Mature Forest Canopy	A	B	B	B	D
	Battery 27	(No Engineers Drawing Available)	0.44	Small Herbaceous Understory with Mature Forest Canopy	A	C	D	B	D

*** Preferred Alternative**

UNIT	FORT	IMAGE	ACREAGE	CURRENT CONDITION	ALTERNATIVES				
					1	2	3	4*	5
Fishhook		(Not To Scale)							
	Fort Welch		0.78	Small Herbaceous Understory with Mature Forest Canopy	A	C	D	B	D
	Fort Gregg		0.48	Small Herbaceous Understory with Mature Forest Canopy	A	C	D	D	D
	Fort Wheaton		0.80	Small Herbaceous Understory with Mature Forest Canopy	A	C	D	B	D

*** Preferred Alternative**

Alternatives (2-4) enhance the interpretation and/or protection of select fortifications by minimizing tree windthrow and making the historic landscape more discernible. Visitors would more easily comprehend the massive scale of the campaign. The strategic advantages, disadvantages, and interdependent relationships between different fortifications within a complex network of trenches, batteries, and forts would also be better understood. The action alternatives, except alternative 5, allow for visitors to learn about the proximity of opposing lines, the defensibility of positions, the vulnerability of troops, and the contrasting complexity and simplicity of trench warfare engineering. Alternative 1 will cause cultural resources to continue to be degraded while maintaining existing interpretation and/or protection. Alternative 5 will maintain current interpretation and slightly reduce impacts to archeological resources.

The alternatives are composed of four treatment options (Table 2) that were compared to the park's interpretive objectives for the individual fortifications. Assigning all appropriate treatment options to each fortification created the alternatives in Table 1 with the letters corresponding to the treatment options.

Description of Treatment Options

Four treatment options (Table 2) were identified to enhance park interpretive objectives and remove or reduce the current threat of tree windthrow thereby improving the protection and preservation of 11 park fortifications. Treatment A describes current management practices while Treatments B, C, and D describe different management actions. Completion of a monitoring plan to determine the effectiveness of the treatment is implicit with each of the action treatment options.

Table 2. Treatment Options

TREATMENT	ACTION
A	Continue Current Management Practices (No Action Alternative)
B	Clear Forest Cover and Convert to Tall Grass and/or Clear Trees from Tall Grass Covered Forts
C	Remove Trees > 12 Inches DBH
D	Remove Hazard Trees

TREATMENT A: Continue Current Management Practices (No Action)

This treatment maintains the status quo of vegetation cover and maintenance actions on the fortifications. The four Main Unit fortifications would remain in grass with some tree cover and the Fishhook fortifications would remain completely forested. The park would continue to repair damages to fortifications when uprooted and dead trees fall on a fortification. Current management for the four Main Unit fortifications includes biannual mowing, removing unhealthy trees and trees subject to windthrow, and providing interpretive trails through the fortifications. Fishhook fortification management entails

maintaining a foot trail to Fort Gregg, Fort Welch, and Battery 27; parking areas adjacent to Forts Fisher, Conahey and Urmston; and interpretive signs at Forts Fisher and Conahey. Interpretive tours and physical and visual access would not be provided inside any of the Fishhook fortifications.

TREATMENT B: Clear Forest Cover and Convert to Tall Grass

Woody vegetation would be removed from the parapets, ditches, moats, and interior of the fortification. Existing park roadways would be used for tree removal except at Fort Wheaton. Unless access would be available on private land, trees would be cut and left at Fort Wheaton.

Tree removal would be phased over 3-4 years and incorporate the use of resource sensitive management practices including use of small vehicles with low-pressure tires to move felled trees while working inside the forts. Erosion and sediment control practices would be used until new vegetation is completely established. Trees would be felled and, in some cases, cut in pieces and lowered to the ground to reduce the potential for damage to the earthen structures. Cranes will be utilized, as needed, to hoist trees over fortifications. Stumps would be ground to a depth of 4-6 inches below the soil line and covered with topsoil. One time application of a NPS approved herbicide would be applied according to product label requirements to kill smaller trees and shrubs and discourage resprouting of stumps.

After woody vegetation is removed, the site would be prepared as needed (e.g. soil amendments, raking, aeration) and immediately seeded with grass. Mulch or other protective methods (e.g. hydroseeding) would be used to inhibit erosion and washing of seed. Sod, jute or other types of netting may be applied to areas too steep to mow or areas of poor growing conditions. Grass/herbaceous vegetative cover would be maintained through biannual mowing. Grass would be maintained at a height of 5-24" on the walls of the fortifications. If necessary, invasive or non-native plants (e.g. poison ivy, honeysuckle) would be periodically killed by a fast decomposing, systemic herbicide according to product label requirements to eliminate their potential for establishment. Observation platforms and trails would be constructed to enhance interpretation and guide visitor access to and through fortifications (Appendix 1). Archeological surveys, erosion protection, and approved trail and platform designs would occur prior to implementation.

TREATMENT C: Remove Trees >12 Inches dbh

Tree seedlings and saplings rarely blow down and uproot. Trees (12+ inches dbh) are more at risk of uprooting because of their larger crown of leaves (Johnson, 1998). Trees smaller than this diameter would be permitted to grow on or nearby fortifications. All trees 12 inches dbh and larger would be removed as described in Treatment B. Tree removal would be phased over 3-4 years and conducted using resource sensitive management practices. Erosion and sediment control devices would be installed prior to tree removal. Herbicides would be sprayed on deciduous tree stumps located on the historic resource to eliminate growth of future hazard trees. Herbicides would also be

used where necessary for periodic spot removal of invasive or non-native plants (e.g. poison ivy, honeysuckle). A NPS approved herbicide would be applied according to product label requirements. Grass seed and mulch would be applied by hand to bare soils (including unauthorized trails), however, limited site preparation would occur. Forest succession will dictate a continual removal of trees 12 dbh and larger due to the quantity of trees on the fortifications. Some rehabilitation of earthworks may continue to be required if small trees uproot. Biannual mowing will continue on Elliott's and Colquitt's Salient and Forts Friend and Haskell. Adaptive management (see Chapter 1 Management Concerns) would be a key component particularly of this treatment option as selection of 12 inch dbh is arbitrary and may need to be revisited based on effectiveness. Trails would be constructed only at Elliott's Salient to enhance interpretation and guide visitor access. (Appendix 1) Archeological surveys, erosion protection, and approved trail designs would occur prior to implementation.

TREATMENT D: Remove Hazard Trees

Hazard trees would be evaluated by park staff and removed on an annual basis while considering earthworks preservation, interpretation, accessibility, and visitor safety (Johnson, 2001). These non-subjective criteria for the hazard rating of trees are based on the particular needs of the NPS and the site. Hazard tree characteristics include trees over 12 inches dbh; forked, broken, or leaning trees; trees with visible decay; large, dead limbs; and position on the earthwork (top of wall, sidewall, and lip of moat would be considered most hazardous). Trees of potential hazard to the fortification would be pruned or removed from the site as in Treatment B except tree stumps would remain. Some rehabilitation of an earthwork may be necessary if trees continue to uproot. Herbicides would be sprayed on deciduous tree stumps located on the historic resource to eliminate growth of future hazard trees. Herbicides would also be applied for spot removal of invasive or non-native plants (e.g. poison ivy, honeysuckle) if they become established on soils that are exposed when a tree uproots.

Preferred Alternative

The preferred alternative as defined by the National Environmental Policy Act (NEPA) is the alternative which an agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors such as interpretive concerns. It is identified in this document so that readers can understand the basis of the recommendations and conclusions in this document. **The preferred alternative is Alternative 4 which removes all woody vegetation from Forts Conahey, Fisher, Wheaton, Welch and Battery 27, (which are presently in forest cover); removes all trees from Forts Friend and Haskell and Colquitt's Salient, (which are presently in grass); removes all trees >12 inches dbh from Elliott's Salient, (which is also in grass); and removes hazard trees only from Fort Urmston and Fort Gregg, (which are presently in forest cover). In addition, observation platforms (Fort Fisher only) and trails (Colquitt's Salient, Fort Haskell, Elliott's Salient, Fort Wheaton, Fort Conahey, and Fort Fisher) would be**

constructed to enhance interpretation and guide visitor access to and through fortifications. This alternative would increase interpretive opportunities and eliminate or reduce damages caused by tree windthrow and mortality at each fortification.

Environmentally Preferred Alternative

The Park Preferred and Environmentally Preferred Alternative is **Alternative Four (4)** as outlined in the EA. This preferred alternative will:

1- clear approximately eight (8) acres of forest and re-seed the area with grass,
2- remove selected trees on approximately nine (9) acres of existing grass covered fortifications, and
3- remove hazard trees on two forts comprising approximately one (1) acre, which will remain in forest cover.

The environmentally preferred alternative is the alternative that would promote the national environmental policy as expressed in NEPA. The preferred alternative is the one which:

1) fulfills the responsibilities of each generation as trustee of the environment for succeeding generations;
2) assures for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3) attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4) preserves important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
5) achieves a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6) enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources.

Seven management objectives that this EA considered to arrive at a holistic earthwork preservation and management plan are:

1-Preserving the Historical Structures and Associated Features

The park's Enabling Legislation states the purpose of the park is to "…preserve for historical purposes the breastworks, earthworks, walls, or other defenses and shelters…"

2-Preserving Archeological Resources

Protective measures should be taken to eliminate the unearthing of buried archeological resources from becoming displaced and exposed to the elements caused by the uprooting of trees. Additionally, roots displace archeological resources and create cavities within the structures when they rot.

3-Providing Interpretive Value

The park's mission is to interpret to the public the integrity and significance of the site and its structures.

4-Promoting Sustainability of the Historic Sites

The preferred alternative should be the one that the park can effectively and economically maintain the preservation treatment over time.

5-Promoting Visitor Accessibility

The Forts, Batteries and Salients should be physically and visually accessible to the public.

6-Providing a Safe Environment

Falling hazards from trees /limbs, holes caused by decayed stumps or dug by illegal relic hunters should be eliminated. Foot-trails, bridges and overlooks should provide safe passage for the visiting public.

7-Considering Effects on other Non-Historic Resources

The removal of trees or other undesirable vegetation and the seeding of an effective grass cover should not have a negative impact on threatened or endangered species or wetlands.

Alternatives Considered But Rejected

Petersburg National Battlefield initially evaluated an additional alternative which would have resulted in removing the trees and maintaining the grass cover in Forts Friend and Haskell and Colquitt's Salient (Treatment B); Elliott's Salient and six Fishhook fortifications would have trees >12 inches dbh removed (Treatment C); and Fort Urmston hazard tree removal (Treatment D). After inventorying the trees on all fortifications, it became apparent that this alternative would result in conditions very similar to the present Alternative 2 therefore, this alternative was rejected.

Chapter 3 Affected Environment

Cultural Resources

All fortifications, associated earthwork features, and archeological resources are elements contributing to the overall significance of Petersburg National Battlefield and its listing in the National Register of Historic Places. Each fortification is located within the park's "cultural zone". A description is included below for each fortification. No further specifications other than engineer's drawings are available.

When the National Historic Preservation Act was passed in 1966 and created the National Register, all historic units of the National Park System were automatically listed. On October 15, 1966, Petersburg National Battlefield was placed on the National Register under the criteria evaluation of A, d, f, 66000831, location Dinwiddie County. According to the Keeper of the Register there is no documentation for the battlefield on file.

However on February 18, 2000, the Keeper signed a new submission for multiple property listing entitled "The Civil War in Virginia, 1861 – 1865: Historic and Archaeological Resources." The Petersburg National Battlefield historic structures which include fortifications are covered under Section "F," pages 110 - 113, entitled "Earthworks." Archaeological Resources are mainly covered under Section "F," pages 113 – 120, entitled: "Campsites, Military Hospitals, Military Headquarters and Military Prisons."

The trenches and earthworks left to us from the American Civil War are rich repositories of archaeological data. Deeply buried in some cases, these artifacts provide significant historic contexts for the earthworks. Past archaeological investigation at Petersburg has produced a large body of information associated with these earthworks and related features. Military equipage and projectiles, storage vessels and accoutrements, uniform buttons and buckles; all are preserved in the trenches and large pits associated with these earthworks. These in situ archaeological contexts tell us much about the common soldier's experience in these earthworks

The State Historic Preservation Office has been notified and briefed concerning this action. A copy of the Review Environmental Assessment was hand-delivered to them.

Description of Main Unit Fortifications

Fort Friend (0.6 acres) was originally constructed as Battery 8 of the Dimmock line of Confederate defenses and was designed for six field guns positioned to face eastward. This fort was one of the Confederate assaulting columns' initial objectives at the beginning of the Battle of Fort Stedman. This battery was seized by Union troops on June 15, 1864, and renamed Fort Friend in recognition of the nearby Friend House. It was then reconfigured with four guns facing westward towards Petersburg, two and one-half miles away. The redoubt, about a mile behind the main Union lines, served a supporting artillery role during the Battle of Fort Stedman (March 25, 1865) manned by

the 11th Massachusetts Battery with three-inch rifled guns. This fortification is situated on a slight rise and is marked by interpretive waysides. This earthwork is maintained in grass cover with approximately 14 trees >12 inches dbh.

Fort Haskell (1.6 acres) was constructed between July 30 and August 20, 1864, and was an official Union siege fort. It was a fully enclosed earthwork designed to hold approximately six field guns manned by a garrison of 250 troops. Fort Haskell was the site where the 14th New York Heavy Artillery (supported by four 12-pounder cannon and four Coehorn mortars) repulsed the Confederate attempt to break through Union defenses during the Battle of Fort Stedman. The attack marked the last large-scale offensive movement of the Army of Northern Virginia and was named for Colonel Frank A. Haskell of the 36th Wisconsin, killed at Cold Harbor. Fort Haskell is one of the better-preserved earthen fortifications in the Main Unit. It stands in a clearing above Poor Creek along the edge of the tour road and has limited access and interpretation. It is maintained in grass cover with approximately 33 trees >12 inches dbh.

Colquitt's Salient (6.6 acres) was named for Confederate Brigadier General Alfred H. Colquitt. This fortified position was constructed (along with adjoining Gracie's Salient) between June 16 and 17, 1864, as part of the Confederate line on the east side of the Petersburg and Norfolk Railroad bed. Confederate defenders successfully withstood a Union assault on the position on June 18th. It was from this position (one of the closest to the Union lines) that the Confederate attack on March 25, 1865, originated. The surviving structures are mostly cleared and include the breastworks, outer picket lines, and a salient angle for artillery pieces. It is in deteriorated but stable condition and is marked by a monument. Colquitt's Salient is maintained in grass cover with approximately 92 trees >12 inches dbh.

Elliott's Salient (0.2 acres) was a well-fortified Confederate position near Cemetery Hill and old Blandford Church. A battery of four guns was positioned behind earthen embankments along with two veteran South Carolina infantry regiments. On July 30, 1864, Union troops detonated 8,000 pounds of black powder that they had placed below the salient by tunneling under the defense work. The massive explosion resulted in extensive casualties and led to the ensuing Battle of the Crater. Elliott's Salient was named for Brigadier General Stephan Elliott, Jr. It was also known as Pegram's Salient after Captain Richard G. Pegram's Virginia Light Artillery (formally Branch's Battery). They were positioned here with Elliott's South Carolina brigade. The Crater has approximately 14 trees >12 inches dbh and is maintained in grass cover through mowing.

Description of Fishhook Fortifications

Fort Urmston (0.4 acres) is situated at the eastern end of the Fishhook unit and was named for Lieutenant Thomas D. Urmston, 12th United States Infantry, killed September 30, 1864, in the Battle of Peebles Farm. Fort Urmston was constructed between October 5-12, 1864, during the engagement at Chappell's farm. The fort is hexagonal, and three of its shorter sides faced north, northeast, and northwest toward enemy positions. Six field guns were positioned *en barbette* (to fire over the walls) and commanded the

approach along Squirrel Level Road. A garrison of 200 occupied the fort including the 61st Pennsylvania and 43rd New York. The fortification sustained extensive disturbance from construction of a nearby schoolhouse (ca. 1930) and clearing in the 1960s which resulted in erosion impacts. This fortification is forested with approximately 7 trees >12 inches dbh.

Fort Conahey (0.5 acres) is located about 800 yards northwest of Fort Urmston and was quickly constructed in the aftermath of the Battle of Peebles Farm. It was named after 2nd Lieutenant John Canahey (NOTE – this spelling is how it appears in regimental history and state rosters) 118th Pennsylvania Infantry, killed September 30, 1864, at Peebles Farm. Unique among the earthen Fishhook defenses, it had enclosed artillery casemates below the parapet level. The fortification is roughly oval in configuration. Seven of its 11 field guns were positioned on the parapet, and four were protected within the lower casemates. Seventy-five troops of the 2nd Division VI Corps were garrisoned at Fort Conahey including 11 Vermont Heavy Artillery. This fortification has a young forest cover with approximately 22 trees >12 inches dbh.

From **Fort Fisher** (4.4 acres), Union forces launched the final successful assault on Confederate positions on April 2, 1865. Fort Fisher, completed by October 18, 1864, would become the largest of all the Union earthen fortifications built during the Petersburg siege. It was named for Lt. Otis Fisher, 8th United States Infantry, killed September 30, 1864, at Peebles Farm. Designed by Lt. C.W. Howell, U.S. Army Engineers, the fort is a four-sided, nearly square redoubt with an armament of seven guns. Its original design called for 12-foot high walls, a 6-foot deep ditch, and a 14-foot wide parapet. Later modifications included the construction of bastions at the four angles of the fort walls. Located on a slight prominence just east of Church Road, the fort held a strategic position near the center of the Fishhook defenses, commanding the terrain to the north and northwest. A signal gun was fired from here at dawn on April 2, 1865, to initiate the assault of the VI Corps on the nearby Confederate lines. Fort Fisher never came under direct assault as little shelling occurred along this part of the line. Among the units stationed here were Batteries C and I, 5th U.S. Artillery, a garrison from the 26th Michigan and 150 men of the 61st New York. The fort continues to exhibit good integrity, with elements of its design (e.g. drainage ditches, banquettes and traverses) still visible. This fortification is forested with many trees >12 inches dbh.

Battery XXVII (27) (0.4 acres), located about 550 yards west of Fort Fisher, was constructed between January and February 1865 to fortify perceived weaknesses along this section of the Fishhook. Stationed between Fisher and Welch were 2nd New York Heavy Artillery and 81st Pennsylvania. With only three faces, it was not an enclosed earthwork and was defensible only against frontal attack. Fort Fisher to the right and Fort Welch to the left, however, provided protective support. Eleven guns were emplaced along Battery 27's 400 foot-long parapet. Although heavily overgrown with vegetation, the site is well preserved with good integrity. The battery is forested with approximately 28 trees >12" dbh.

Fort Welch (0.8 acres), located at the westernmost bend of the Fishhook, was built between October 3-10, 1864, immediately following the Battle of Peeble's Farm. It was designed in the shape of a pentagon and was capable of defense against enemy attack from the northwest, west, and southwest. Fort Welch was named for Colonel Norval E. Welch of the 16th Michigan, killed September 30, 1864, at Peebles Farm while assaulting Confederate Fort Archer. Its parapets stood over 10 feet above the ditch, and accommodated nine guns placed to fire both through openings (*embrasures*) in the walls and over the top of the walls (*en barbette*). Stationed here was 5th New Hampshire, 183rd Pennsylvania. NOTE – Those regiments between Fisher and Gregg were part of the II Corps, 1st and 2nd Brigade, 1st Division (winter 1864-65). Fort Welch is considered among the finest surviving earthworks in the western range of the park. Fort Welch is forested with many trees >12 inches dbh.

Fort Gregg (0.5 acres) was constructed between October 3-27, 1864, at the southwestern terminus of the Fishhook. This fort was named for Lt. James P. Gregg, 45th Pennsylvania, killed September 30, 1864, at Peebles Farm. The hexagonal redoubt was intended to guard the line's left flank and commanded a range of nearly 200 degrees of enemy terrain. Its parapet walls rise about 12 feet above the base of its ditch. Fort Gregg had platforms for six field guns and was occupied by a 75-man garrison from the 88th New York. Fort Gregg is forested with approximately 14 trees >12 inches dbh.

Fort Wheaton (0.8 acres) is located to the east of Fort Gregg, protected by the Fishhook lines to the north and west. It was originally constructed in August 1864 by Confederate forces and named Fort Archer. Later it was named for Captain James H. Wheaton, 1st Michigan Infantry, killed September 30 1864, at Peebles Farm. Early in the Battle of Peeble's Farm, the fort fell to Union forces under the command of Col. Norval Welch of the 5th Corps; Welch died in the assault. It was reconfigured as a second line defense with emplacements for six guns. The hexagonal fort lies within a heavily wooded tract with many trees >12 inches dbh.

Natural Resources

The earthworks of the Main Unit and Fishhook are located in a suburban/rural setting. In general, the natural features and resources are those commonly found in suburban/rural areas.

Topography: Petersburg National Battlefield is located in the gently rolling hills of Virginia. The main unit is located in Prince George County and the city of Petersburg and is 1,427 acres. The Fishhook Unit is in Dinwiddie County and is approximately 38 acres. The forts, batteries, and salients were constructed on the most elevated areas of the landscape. The project area for the 11 fortifications totals 16.8 acres of which 7.8 are in forest cover and 9.0 are in grass cover with scattered trees.

Soils and Prime Farmland: Soils in the project area are well-drained, sandy loam. Due to the construction of the forts, an inverted soil profile is common. Soils form steep slopes on the sides of the earthen fortifications. No prime farmlands have been designated within the project area.

Wildlife: Limited baseline inventories have been conducted for birds, fish, amphibians, reptiles, mammals or terrestrial macro-invertebrates for the park. It would be expected that wildlife typical of parks in an suburban/rural setting (e.g. white-tailed deer, white-footed mouse, red-tailed hawk, and garter snake) utilize the habitats in and around the fortifications. No fish are present due to the restricted water resources in the project area. Other aquatic/amphibious species may be present, particularly during the breeding season, in the temporarily or seasonally wet areas.

Vegetation: In general, most vegetation on the fortifications is even-aged, mature (>12 inches dbh) forest comprised of oak, hickory, and mixed conifer trees. These secondary forests are mostly healthy although some trees are diseased, infested with Pine Bark Beetle, or have heart rot. A variety of shrub species form a medium to dense understory layer of invasive briars and climbing vines. Herbaceous plants grow from a variable layer of soil benefiting, in some places, from a mulch of partially decomposed leaves and needles. Non-native invasive species such as Tree-of-Heaven and Japanese Honeysuckle are also present. Fortifications in a non-forested state are covered and maintained in grass/herbaceous plants. A decade of prior management relied on a combination of native and non-native grasses to vegetate the soils. Grasses on the fortifications are currently mown approximately twice a year to control growth of woody vegetation.

Threatened and Endangered Species: The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage conducted an inventory in 1991 for natural heritage resources in and near the park. No habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities and significant geologic formations were located in the park (Appendix 2, Letter from DCR). As no federally listed species were discovered in the park, the U.S. Fish and Wildlife Service was not contacted regarding impacts to federal listed species in the project area.

Water Resources and Wetlands: There are no permanent or intermittent rivers, streams, floodplains, ponds, etc. in the project area. There are, however, seasonally or temporarily flooded areas associated with the moat at the base of Fort Fisher as defined by the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The U.S. Army Corps of Engineers (COE) Norfolk District evaluated each fortification for jurisdictional waters or wetlands. No jurisdictional waters or wetlands were found, therefore, no COE permit is necessary for the project (Appendix 3, Letter from COE). Letter from COE failed to list Elliott's Salient and Fort Urmston, however, these sites were also investigated and should have been included in the "address of job site" block. As each fortification is surrounded by a moat, any water runoff is contain in these moats and returned to ground water.

Air Quality: Petersburg National Battlefield is situated in a highly industrialized area with high air pollution primarily sulfates, nitrates, chlorides, and iron. The Virginia Department of Air Pollution Control classifies the park as a non-attainment area for ozone and as a Class II area for all other major air pollutants.

Visitor Experience

Visibility/Views: The four fortifications in the Main Unit with a few scattered, large trees are easily viewed and interpreted. Most features and components of the Fishhook earthen structures are not easily viewed and have limited interpretive ability because they are obscured by vegetation. On the other hand, three forested fortifications block views and sounds associated with a large industrial facility.

Visitor Management: Interpretive trails are maintained at the four fortifications in the Main Unit. Limited access via a fire/farm road is available to Fort Welch and Battery 27 and a trail leads visitors to Fort Gregg. Forts Fisher, Conahey and Urmston have an adjacent parking area. No access is provided to Fort Wheaton or inside any of the Fishhook fortifications due to thick understory vegetation. Interpretive signs are displayed at Forts Fisher and Conahey. Unauthorized trails exist at all fortifications.

Chapter 4 Environmental Consequences

There would be no impacts to topography, prime farmland, threatened and endangered species, water resources, and jurisdictional wetlands from implementation of any of the alternatives (see Chapter 3). There are, however, other possible cultural, natural, and socioeconomic impacts associated with executing each alternative. These environmental consequences and cumulative effects are discussed below.

Cultural Resource Impacts

Methodology

The assessment of impacts on cultural resources and historic properties was made in accordance with regulations of the Advisory Council on Historic Preservation (36 CFR 800) implementing section 106 of the National Historic Preservation Act. Following a determination of the areas of potential effect, cultural resources were identified within these areas that are either listed in or eligible for listing in the National Register of Historic Places. Within the current project area, the fortifications, earthworks and potential archeological resources associated with these structures are resources contributing to the National Register significance of Petersburg National Battlefield.

An assessment was made of the nature and extent of effects on cultural resources anticipated from implementing proposed undertakings. Cultural resources can be affected by actions that alter in any way the attributes that qualify the resources for inclusion in the National Register. Adverse effects can result when the integrity of a resource's significant characteristics is diminished. Consideration was given both to the effects anticipated at the same time and place of the undertaking, and to those potentially occurring indirectly at a later time and distance.

Alternative 1

Treatment A: Continuation of current management practices would result in continued indirect adverse effects on significant structural features and associated archeological resources. This would occur as a consequence of windthrown trees falling on parapets and other features, or as potential archeological resources are disturbed by the unearthed rootballs of fallen trees. Unhealthy trees or others prone to windthrow, are more closely monitored and removed if found to pose a significant risk of damage. The Fishhook fortifications are more densely forested and more at risk from fallen trees. Visitors are more likely to create unmanaged social trails over the earthworks that often result in soil erosion and earthwork damages, however, forest cover tends to hinder creation of unauthorized trails on earthworks. However, visitors tend to gravitate to the top of the walls to capture a better view. The dense vegetation also impedes interpretation, and visitors have fewer opportunities to fully comprehend the scale and interrelationship of the fortifications along this line compared to the Main Unit fortifications.

(Treatments B, C, and D are not applicable.)

Alternative 2

Treatment B: Trees and woody vegetation growing on and around Colquitt's Salient and Forts Friend, Haskell, Conahey, and Fisher would be removed and bare areas would be seeded with grass. Implementation of this treatment would be expected to have no adverse effect on significant cultural resources provided there would be an appropriate long-term commitment for earthwork preservation with routine monitoring to assess resource conditions and treatment effectiveness. Tree removal would eliminate the possibility of structural disturbance to the fortifications resulting from tree windthrow. Careful removal of trees would avoid damage to fortification features, and use of erosion control devices would protect the earthen structure by controlling soil erosion. Areas covered and maintained with grass/herbaceous groundcover would prevent erosion and the possible loss of historic structural integrity. Resource protection measures would ensure that significant structural and archeological resources are avoided during periodic maintenance activities although mowing would increase contact with the earthen structures and the potential for damage. Provided visitors stay on designated walkways, the interpretive plan for construction of observation platforms and trails (Appendix 1) would ensure resource protection and not visually intrude on the historic scene. Potential archeological resources would also be protected by measures to control erosion and eliminate disturbance from uprooted trees. Caution would be required when grinding tree stumps to avoid disturbance of deeper soil layers that may contain archeological resources.

Treatment C: Elliott's Salient, Battery 27, and Forts Welch, Gregg, and Wheaton would have trees >12 inches dbh only removed. Removal of only large trees would reduce, not eliminate, the possibility of structural disturbance to the fortifications resulting from tree windthrow. Other impacts would be the same as Treatment B except there would be no potential for damage to the fortification from mowing equipment. Comprehensive interpretation would be comparatively limited, as small trees would remain at Forts Welch, Gregg, and Wheaton, and Battery 27 resulting in a less open landscape compared to Treatment B. Minimal (wayside exhibits only) interpretation, however, are planned for all but Elliott's Salient and Fort Wheaton.

Treatment D: Fort Urmston would receive annual removal of hazard trees. Limiting tree removal to hazard trees only would result in less long-term cultural resource protection because trees that are not specifically identified as "hazardous" may still blow over during storm events damaging structural features of the earthworks and disturbing archeological resources. Comprehensive interpretation would be comparatively limited, as most trees would remain resulting in a less open landscape as compared to Treatments B and C. This would, however, be consistent with the interpretive plan for this site because no interpretation is planned for this fortification.

(Treatment A is not applicable.)

Alternative 3

This alternative reflects the recommendations of the Cultural Landscape Report prepared for the Fishhook fortifications (Olmsted Center for Landscape Preservation, 1999).

Treatment B: Same as Alternative 2.

Treatment C: Elliott's Salient would have a few trees >12 inches dbh removed which would greatly reduce the threat of tree windthrow at this site. Other impacts would be the same as under Alternative 2 except interpretative opportunities would be unchanged.

Treatment D: Battery 27 and Forts Urmston, Welch, Gregg and Wheaton would receive annual removal of hazard trees. Limiting tree removal to hazard trees only would result in less long-term cultural resource protection at these sites and reduced interpretive opportunities. This would result because trees that are not specifically identified as "hazardous" may still blow over during storm events damaging structural features of the earthworks and disturbing archeological resources. Comprehensive interpretation would be comparatively limited, as a few scattered trees would be removed at each site resulting in a less open landscape as compared to Treatments B and C. Minimal (wayside exhibits only) or no interpretation, however, is planned for all but Fort Wheaton.

(Treatment A is not applicable.)

Alternative 4 (Preferred)

Treatment B: All fortifications, except Elliott's Salient and Forts Urmston and Gregg, would have trees and woody vegetation removed and bare areas seeded with grass. In common with Alternatives 2 and 3, this treatment would be expected to have no adverse effect on significant cultural resources. **Applying this treatment under this alternative entails the greatest degree of overall clearing compared with the other alternatives, which would maximize the openness of the landscape and permit the greatest interpretive opportunities.** Maintenance of grass height on the walls of the structures at 5-24 inches would discourage creation of unauthorized trails, delineate the earthworks, and protect them from erosion. Resource protection measures would ensure that significant structural and archeological resources are protected both during initial clearing operations and subsequently during periodic maintenance activities. Removing all woody vegetation from these fortifications would eliminate the potential for structural damage that may result from the windthrow of smaller diameter trees or large trees not identified as hazardous that would remain for five fortifications under Alternative 2 and Alternative 3. Maintenance of the grass/herbaceous cover at all sites would, however, increase the potential for damage to the earthen structures from mowing equipment.

Treatment C: Same as Alternative 3.

Treatment D: Forts Urmston and Gregg would receive annual removal of hazard trees. Limiting tree removal to hazard trees only would result in less long-term cultural

resource protection at these sites and reduced interpretive opportunities. This would result because trees that are not specifically identified as "hazardous" may still blow over during storm events damaging structural features of the earthworks and disturbing archeological resources. Comprehensive interpretation would be comparatively limited, as a few scattered trees would be removed resulting in a less open landscape as compared to Treatments B and C. Minimal (wayside exhibits only) and no interpretation, however, are planned for Fort Gregg and Fort Urmston, respectively.

(Treatment A is not applicable.)

Alternative 5

Treatment D: This treatment calls for the annual removal of hazard trees at all fortifications. Although no direct adverse effects to cultural resources would be expected from undertakings proposed by this treatment, limiting tree removal to hazard trees only would, in comparison with the other action alternatives, result in the least degree of long-term cultural resource protection. Trees that are not specifically identified as "hazardous" may still blow over during storm events damaging structural features of the earthworks and disturbing archeological resources. Opportunities for comprehensive interpretation would be comparatively limited, as only a few trees would be removed at each site. Minimal (wayside exhibits only) or no interpretation, however, is planned for four of the 11 fortifications.

(Treatments A, B, and C are not applicable.)

Natural Resource Impacts

Methodology

The impacts assessment for natural resources was conducted in accordance with the NPS Organic Act, NPS 77: Natural Resources Management Guideline, NPS Management Policies 2001, Director's Order 2: Planning, and Director's Order 12: NPS Environmental Compliance. These documents provide general guidance for compliance with various environmental laws, executive orders, and other regulations, among others the National Environmental Policy Act of 1969, The Endangered Species Act, the Clean Air Act, the Clean Water Act, and Executive Order 11990 (Protection of Wetlands). This assessment was also based on available research, knowledge of resources in the park, and on best professional judgement.

Alternative 1

Treatment A: Perpetuation of the current management practices at all 11 sites (16.8 acres) would not eliminate or reduce the threat of tree windthrow at any site. Vegetation would remain primarily mature forest on the seven Fishhook fortifications and grass with

scattered, large trees on the four Main Unit fortifications. Soils would continue to be protected on fortifications with either a forest canopy/leaf litter or with a grass cover. Soil displacement, however, would continue to occur where storm events uproot trees and result in damage to the fortification. Forts in forest cover will continue to have unauthorized trails on the tops of earthworks because visitors tend to gravitate to these higher grounds expecting better views within the thick forest understory. In general, wildlife species that utilize forested habitats would be favored under this alternative.

(Treatments B, C, and D are not applicable.)

Alternative 2

Treatment B: Three Main Unit fortifications (Forts Friend and Haskell and Colquitt's Salient (8.8 acres)) with scattered mature trees and two forested Fishhook fortifications (Forts Conahey and Fisher (4.9 acres)) would be converted to tall grass. This alternative would eliminate the threat of tree windthrow on these five fortifications. Use of erosion and sediment controls during tree and stump removal and site preparation would reduce soil displacement. Soils would be protected in the long term by grass cover once permanently and completely established on each site. Until grass cover is established, there is the potential for soil movement during rain events. However, in the short term, hydroseed mulch provides adequate protection reducing, if not eliminating, soil movement. Soil disturbance allows for the possibility of natural colonization by non-native and invasive vegetative species, however, herbicide application would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) during herbicide application to kill woody vegetation and for spot removal of non-native and invasive vegetation would result in minimal, if any, environmental impacts. Construction of interpretive platforms and trails would result in linear areas of compacted soils. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal and trail construction. Wildlife that favors grassland habitat (e.g., Eastern bluebird) may occupy these sites. Wildlife living in the existing forested habitat (e.g., squirrels, owls) would be displaced and some mortality could occur. Mowing operations will have minimal impacts to most wildlife. Some wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area.

Treatment C: Trees (>12 inches dbh) would be removed from Elliott's Salient and four Fishhook fortifications (2.7 acres) leaving small woody vegetation at all but Elliott's Salient (grass cover currently in place). In general, removal of overstory trees would eliminate the threat of large tree windthrow and encourage understory growth and tree seedling development. Use of erosion and sediment controls would reduce soil movement during tree removal and until vegetative cover is complete. Less soil movement and disturbance would be expected with this treatment because fewer trees would be removed. In some areas, removal of large trees would result in most trees being removed and a loss of forest canopy similar to Treatment B. More trees would be removed under this treatment as compared to hazard tree removal (Treatment D). The ground layer of organic matter (i.e., humus, invertebrates, microbes, fungi) would be

removed under Treatment B but remain in place under this treatment. Tree removal would increase sunlight reaching the forest floor and encourage the growth of understory vegetation that would continue to provide a protective canopy and add detritus to the leaf litter. Soils would be stabilized by existing grass at Elliott's Salient and small woody vegetation at Fishhook fortifications. Although greatly reduced, there would still be a possibility for soil displacement if small trees uproot. Soil disturbance from tree removal allows for the possibility of natural colonization by non-native and invasive vegetative species, however, herbicide application would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) for spot removal of non-native and invasive species would result in minimal, if any, environmental impacts. Construction of interpretive platforms and trails would result in areas of compacted soils. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal and trail construction. Wildlife species that prefer early successional and young forests (e.g., rabbits, Carolina wren) would benefit most from this alternative while wildlife species that live in mature forest (e.g., squirrels, owls) would be negatively affected. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, some wildlife would be expected to acclimate.

Treatment D: Fort Urmston (0.4 acres) would have hazard trees removed annually which would reduce the threat of tree windthrow at this site. Use of erosion and sediment controls during tree removal would reduce soil movement in the short term. The healthy, mature trees that remain would safeguard soils by providing a forest canopy and leaf litter. More trees would remain under this treatment as compared to Treatments B and C. The ground layer of organic matter (i.e., humus, invertebrates, microbes, fungi) would remain in place under this treatment. Most large trees would remain under this treatment as compared to Treatment C. Tree removal would increase sunlight reaching the forest floor and encourage the growth of understory vegetation that would continue to provide a protective canopy and add detritus to the leaf litter. Although greatly reduced, there would still be a possibility for soil displacement if trees uproot. Soil disturbance from tree removal allows for the possibility of colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal. In general, wildlife species that inhabit forests would continue to benefit and few animals would be impacted by the removal of a few trees. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, most wildlife would be expected to acclimate.

(Treatment A is not applicable.)

Alternative 3

This alternative reflects the recommendations of the Cultural Landscape Report prepared for the Fishhook fortifications (Olmsted Center for Landscape Preservation, 1999).

Treatment B: Same as Alternative 2.

Treatment C: A few trees (>12 inches dbh) would be removed from Elliott's Salient (0.2 acres) resulting in eliminating the threat of large tree windthrow at this site. Mowing would continue to discourage understory growth and tree seedling development. This treatment would have little impact to soil, air, and wildlife as few trees would be removed and erosion and sedimentation controls would reduce soil movement during tree removal. Soil disturbance from tree removal allows for the possibility of natural colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Construction of trails would result in areas of compacted soils.

Treatment D: Forts Urmston, Welch, Gregg, and Wheaton, and Battery 27 (2.9 acres) would have hazard trees removed annually which would reduce the threat of tree windthrow at these sites. Use of erosion and sediment controls during tree removal would reduce soil movement in the short term. The healthy, mature trees that remain would safeguard soils by providing a forest canopy and leaf litter. More trees would remain under this treatment as compared to Treatments B and C. The ground layer of organic matter (i.e., humus, invertebrates, microbes, fungi) would remain in place under this treatment. Most large trees would remain under this treatment as compared to Treatment C. Tree removal would increase sunlight reaching the forest floor and encourage the growth of understory vegetation that would continue to provide a protective canopy and add detritus to the leaf litter. Although greatly reduced, there would still be a possibility for soil displacement if trees uproot. Soil disturbance from tree removal allows for the possibility of colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal. In general, wildlife species that inhabit forests would continue to benefit and few animals would be affected by the removal of a few trees. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, most wildlife would be expected to acclimate.

(Treatment A is not applicable.)

Alternative 4 (Preferred)

Treatment B: Three Main Unit (Forts Friend and Haskell and Colquitt's Salient (8.8 acres)) and five Fishhook fortifications (Forts Conahey, Fisher, Welch, Wheaton, and Battery 27 (6.7 acres)) would be converted to tall grass, eliminating the threat of tree windthrow on eight fortifications. Use of erosion and sediment controls during tree and stump removal and site preparation would reduce soil displacement. Soils would be protected in the long term by grass cover once permanently and completely established

on each site. Until grass cover is established, there is the potential for soil movement during rain events. However, in the short term hydroseed mulch provides adequate protection reducing, if not eliminating, soil movement. Soil disturbance allows for the possibility of natural colonization by non-native and invasive vegetative species, however, herbicide application would limit their potential for establishment. This alternative would require the use of the most herbicides. Following herbicide product conditions (e.g. no application directly to water) during herbicide application to kill woody vegetation and for spot removal of non-native and invasive vegetation would result in minimal, if any, environmental impacts. Construction of interpretive platforms and trails would result in linear areas of compacted soils. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal and trail construction. Wildlife that favors grassland habitats (e.g., Eastern bluebird) would benefit at these sites. Wildlife living in the existing forested habitat (e.g., squirrels, owls) would be displaced and some mortality could occur. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, some wildlife would be expected to acclimate. Mowing operations will have minimal impacts to most wildlife.

Treatment C: Trees (>12 inches dbh) would be removed from Elliott's Salient (0.2 acres) eliminating the threat of large tree windthrow at this site. Mowing would continue to discourage understory growth and tree seedling development. This treatment would have little impact to soil, air, and wildlife as few trees would be removed and erosion and sedimentation controls would reduce soil movement during tree removal. Soil disturbance from tree removal allows for the possibility of natural colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Construction of trails would result in areas of compacted soils.

Treatment D: Forts Urmston and Gregg (0.9 acres) would have hazard trees removed annually which would reduce the threat of tree windthrow at these sites. Use of erosion and sediment controls during tree removal would reduce soil movement in the short term. The healthy, mature trees that remain would safeguard soils by providing a forest canopy and leaf litter. More trees would remain under this treatment as compared to Treatments B and C. The ground layer of organic matter (i.e., humus, invertebrates, microbes, fungi) would remain in place under this treatment. Most large trees would remain under this treatment as compared to Treatment C. Tree removal would increase sunlight reaching the forest floor and encourage the growth of understory vegetation that would continue to provide a protective canopy and add detritus to the leaf litter. Although greatly reduced, there would still be a possibility for soil displacement if trees uproot. Soil disturbance from tree removal allows for the possibility of colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal. In general, wildlife species that inhabit forests would continue to benefit and few animals would be

affected by the removal of a few trees. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, most wildlife would be expected to acclimate.

(Treatment A is not applicable.)

Alternative 5

Treatment D: All 11 fortifications (16.8 acres) would have hazard trees removed annually which would reduce the threat of tree windthrow at all sites. Use of erosion and sediment controls during tree removal would reduce soil movement in the short term. The healthy, mature trees that remain would safeguard soils by providing a forest canopy and leaf litter. The ground layer of organic matter (i.e., humus, invertebrates, microbes, fungi) would remain in place under this treatment. Most large trees would remain under this treatment as compared to Treatment C. Tree removal would increase sunlight reaching the forest floor and encourage the growth of understory vegetation that would continue to provide a protective canopy and add detritus to the leaf litter. Although greatly reduced, there would still be a possibility for soil displacement if trees uproot. Soil disturbance from tree removal allows for the possibility of colonization by non-native and invasive vegetative species, however, herbicide use would limit their potential for establishment. Following herbicide product conditions (e.g. no application directly to water) would result in minimal, if any, environmental impacts. Localized air quality may be diminished in the short term by an increase in dust particles created during tree removal and trail construction. In general, wildlife species that inhabit mature forests would continue to benefit and few animals would be affected by the removal of a few trees. Wildlife would be disturbed in the short and long term by the increased human activity (e.g., maintenance workers, visitors) in the area, however, most wildlife would be expected to acclimate.

(Treatments A, B, and C are not applicable.)

Visitor Experience Impacts

Alternative 1

Treatment A: Perpetuation of the current management practices would continue to limit visual and physical access to the forested Fishhook fortifications. Existing mature forests would continue to block views and sounds associated with nearby developed areas, however, interpretive ability would remain limited particularly at the Fishhook fortifications. Interpretation of the Main Unit structures would remain the same and unauthorized trails would continue to pervade all 11 fortifications.

(Treatments B, C, and D are not applicable.)

Alternative 2

Treatment B: Three fortifications in the Main Unit (Forts Friend and Haskell and Colquitt's Salient) and two Fishhook fortifications (Forts Conahey and Fisher) would be converted to tall grass allowing better visual access. Greater interpretation and physical access to the historic resources would occur as new trails are developed and unauthorized trails removed at these five sites. Maintenance of grass height on the walls of the structures at 5-24 inches would discourage creation of unauthorized trails and better delineate the earthworks. The existing tree buffer will remain intact with additional trees being planted on the neighboring industrial development. This buffer will help reduce visual and audible intrusions. Visitor access would be curtailed at these fortifications during tree removal and possibly for trail construction.

Treatment C: Visual and physical access would improve slightly at Elliott's Salient because only a few trees would be removed. Large tree removal at the four Fishhook fortifications would allow short-term visual access on existing park trails. In general, proliferation of understory vegetation at the Fishhook fortifications would probably reduce visual access in the long term. Physical access and interpretative potential would increase as a new trail is developed at Elliott's Salient only but not at the other four Fishhook sites, where trails will not be constructed. Visitor access would be curtailed during tree removal and periodically (every 5 years) thereafter during subsequent removal of large trees at these sites.

Treatment D: Most trees would remain on Fort Urmston blocking the view of this fortification. Providing physical access and interpretation of the historic resources would not occur because there is no recommendation for interpretive development at Fort Urmston. Visitor access may be curtailed during annual hazard tree removal.

(Treatment A is not applicable.)

Alternative 3

This alternative reflects the recommendations of the Cultural Landscape Report prepared for the Fishhook fortifications (Olmsted Center for Landscape Preservation, 1999).

Treatment B: Same as Alternative 2.

Treatment C: Removal of a few large trees and continued mowing at Elliott's Salient would maintain the open nature of this fortification. Visual and physical access would improve to some extent. Visitor access would be curtailed only during removal of the few large trees on the site.

Treatment D: Most trees would remain on Forts Urmston, Welch, Gregg, and Wheaton, and Battery 27 which would reduce the opportunity for physical and visual access and limit interpretive potential. Minimal (wayside exhibits only) or no interpretation,

however, is planned for all forts. Visitor access may be curtailed during annual hazard tree removal at all sites.

(Treatment A is not applicable.)

Alternative 4 (Preferred)

Treatment B: All fortifications (except Elliott's Salient and Forts Urmston and Gregg) would be converted to tall grass allowing better visual access. Greater interpretation and physical access to the historic resources would occur as new trails are developed and unauthorized trails removed at these sites. Maintenance of grass height on the walls of the structures at 5-24 inches would discourage creation of unauthorized trails, delineate the earthworks, and protect them from erosion. The existing tree buffer, between Forts Conahey and Fisher and the steel plant, will remain intact. Additionally, more trees will be planted by the steel company, on their property, which will help reduce visual and audible intrusions. Visitor access would be curtailed at these fortifications during tree removal and possibly for trail construction.

Treatment C: Same as Alternative 3, removal of a few large trees and continued mowing at Elliott's Salient, would maintain the open nature of this fortification. Visual and physical access would improve to some extent. Visitor access would be curtailed only during removal of the few large trees on the site.

Treatment D: Most trees would remain on Forts Urmston and Gregg which would reduce the opportunity for physical and visual access and limit interpretive potential. Minimal (wayside exhibit only) or no interpretation, however, is planned for Forts Urmston and Gregg, respectively. Visitor access may be curtailed during annual hazard tree removal.

(Treatment A is not applicable.)

Alternative 5

Treatment D: Most trees would remain on all 11 fortifications, which would reduce the opportunity for physical and visual access and limit interpretive potential particularly at the forested Fishhook fortifications. Large trees, however, would continue to block some views and sounds associated with a nearby steel plant near three fortifications. Minimal (wayside exhibits only) or no interpretation is planned for four sites. Visitor access may be curtailed during annual hazard tree removal.

Treatments A, B, and C are not applicable.

Projected Costs

Current annual costs for mowing the grass cover in the four Main Unit fortifications (Treatment A) are provided in Table 3. Gross costs for the other three treatments are based on the *Cost Analysis for Preserving Earthen Forts* (Petersburg National Battlefield, 2001) which was prepared to obtain the most accurate cost estimates for the preferred alternative (Alternative 4).

Treatment B: The one-time cost of conversion from forest cover to grasses includes tree and stump removal, herbicides, lime/fertilizer, hydroseed, and labor. Labor costs include a tree removal supervisor and wage grade (WG) personnel to cut and remove understory, rake earthworks to mineral soil and aerate.
Application of lime/fertilizer and hydroseeding will be provided by contractor.

Treatment C: Cost estimates for removal of trees greater than 12 inches dbh in 2001 include tree removal, limited hand seeding and mulching, herbicide application to hardwood tree stumps on the mounds, and labor. Labor costs associated with implementation of Treatment C is complicated by the presence of non-targeted trees which makes removal of the desired trees more difficult and time consuming. Although fewer trees would be removed as compared to Treatment B, the same labor cost for the tree removal supervisor for Treatment B was used to compensate for the additional time and effort required for this treatment. The wage grade personnel would not remove understory vegetation or do site preparation under Treatment C, however, felled trees would need to be removed from site. So 1/3 of their Treatment B labor costs was used in computing the costs for this treatment.

Treatment D: Hazardous tree removal costs for 2001 include tree removal, herbicide application to hardwood tree stumps on the mounds, and labor. Labor costs provided for hazard tree removal at Forts Urmston and Gregg were extrapolated to the other fortifications receiving this treatment. Hazard tree removal cost for Colquitt's Salient is based on a State Forester's assessment that approximately 25% of the trees at the site have "heart rot". Hazard tree removal costs at Forts Friend, Haskell and Conahey and Elliott's Salient are unknown.

Implementation of Treatment B (conversion to grass) would require annual mowing thereafter with costs as represented in Table 3. Treatment D would also incur costs annually as remaining trees are evaluated and removed if determined to be a hazard to a fortification. In treatment C, forest succession will dictate a continual removal of trees 12 dbh and larger. Succeeding tree removal costs for Treatments C and D are not represented in Table 3.

Table 3 contains estimated costs based on the life cycle of the eastern deciduous forest. The costs are gross 2001 figures that have not been adjusted for inflation. Science and understanding of earthworks management is evolving and changes in management prescriptions are anticipated. It would be expected that the costs associated with management of these resources might also change if the management prescriptions

change. The park's General Management Plan (including management of the earthworks) is scheduled to be revisited in approximately 15 years.

Table 3. Estimated Costs Based on Life Cycle

	Treatment A Current Annual Mowing Costs $	**Treatment B*** One-time Cost of Conversion to Grasses Plus Subsequent Annual Mowing Costs $	**Treatment C** Initial Large (>12" dbh) Tree Removal Costs $**	**Treatment D** Initial Hazard Tree Removal Costs $**
Fort Friend	1,000	16,751 + 500	N/A	Unknown
Fort Haskell	4,000	45,613 + 3,000	N/A	Unknown
Colquitt's Salient	4,000	102,070 + 3,000	N/A	19,456
Elliott's Salient	6,000	N/A + 5,000	15,088	Unknown
Fort Urmston	N/A	N/A	N/A	2,686
Fort Conahey	N/A	24,799 + 1,000	N/A	Unknown
Fort Fisher	N/A	216,144 + 7,000	N/A	4,754
Battery 27	N/A	28,994 + 1,000	15,697	658
Fort Welch	N/A	46,864 + 1,000	31,158	3,055
Fort Gregg	N/A	N/A	14,832	6,296
Fort Wheaton	N/A	44,592 + 1,500	23,041	605

*The National Park Service's Development Advisory Board conducted a value analysis report in July 1998 for this project. The findings were that the best value for the long term was Treatment B. This is based on life cycle cost methodology, which rated preservation of structures, interpretive value, visitor safety, access, maintainability and effects on other resources.

**Costs are unknown for subsequent annual large/hazard tree removal due to fluctuating growth cycles and mortality rates.

Alternative 1

Treatment A: Maintenance activities would include biannual mowing of the four Main Unit fortifications (approximately $15,000) and repairing damages to the 11 fortifications (up to $20,000) when tree uprooting occurs through natural mortality or windthrow.

Total annual cost for implementation of this alternative would be up to $35,000.

(Treatments B, C, and D are not applicable.)

Alternative 2

Treatment B: Clearing forest cover and converting to tall grass at Colquitt's Salient and Forts Friend, Haskell, Conahey, and Fisher would cost approximately $405,377. Annual mowing at the three Main Unit sites would entail less management effort than under Alternative 1, because mowing and trimming around trees increases labor time. Annual mowing costs for the five sites would be approximately $14,500. Although Elliott's

Salient would receive Treatment C under this alternative, it would continue to be mown biannually and would have somewhat reduced mowing costs of approximately $5,000.

Treatment C: Large tree (>12 inches dbh) removal would occur one time at Elliott's Salient and as needed at Battery 27, and Forts Welch, Gregg, and Wheaton. Costs associated with one-time tree removal at Elliott's Salient and initial large tree removal at the Fishhook fortifications total approximately $99,816. Successive treatment costs are unknown. Some annual windthrow and mortality of smaller trees may occur resulting in additional costs associated with repairs to these earthen structures.

Treatment D: Hazard tree removal costs at Fort Urmston are approximately $2,686 plus hazard tree evaluation cost of approximately $150.

Total costs for *initial* implementation of this alternative would be approximately $507,879 plus $19,650 annual mowing and hazard tree assessment costs.

(Treatment A is not applicable.)

Alternative 3

This alternative reflects the recommendations of the Cultural Landscape Report prepared for the Fishhook fortifications (Olmsted Center for Landscape Preservation, 1999).

Treatment B: Clearing trees on existing grass covered forts and/or clearing forest cover and converting to tall grass at Colquitt's Salient and Forts Friend, Haskell, Conahey, and Fisher would cost approximately $405,377. Annual mowing at the three Main Unit sites would entail less management effort than under Alternative 1, because mowing and trimming around trees increases labor time. Annual mowing costs for the five sites would be approximately $14,500. Although Elliott's Salient would receive Treatment C under this alternative, it would continue to be mown biannually and would have somewhat reduced mowing costs of approximately $5,000.

Treatment C: Large tree (>12 inches dbh) removal would occur one time at Elliott's Salient costing approximately $15,088. Some windthrow and mortality of small cedar trees would be expected over time resulting in very limited, if any, repairs to this earthen structure.

Treatment D: Annual hazard tree assessment and marking would occur at Battery 27 and Forts Urmston, Welch, Gregg, and Wheaton costing approximately $1,000/year. Initial removal of hazard trees at these five fortifications would total approximately $13,300. Some windthrow and mortality of trees may still occur that may require repairs to an earthen structure.

Total costs for *initial* implementation of this alternative would be approximately $433,765 plus annual mowing and hazardous tree assessment costs of $20,500.

(Treatment A is not applicable.)

Alternative 4 (Preferred)

Treatment B: Clearing trees on existing grass covered Forts Friend and Haskell, and Colquitt's Salient and/or clearing forest cover and converting to tall grass on Forts Conahey, Fisher, Welch, Wheaton and Battery 27 would cost approximately $525,827. Annual mowing costs following conversion to grasses would be approximately $23,000 (including Elliott's Salient).

Treatment C: Large tree removal at Elliott's Salient would cost approximately $15,088. Some windthrow and mortality of small cedar trees would be expected over time resulting in very limited, if any, repairs to this earthen structure.

Treatment D: Annual hazard tree assessment and marking would occur at Forts Urmston and Gregg costing approximately $400/year. Initial removal of hazard trees at these fortifications would total approximately $8,982. Some windthrow and mortality of trees may still occur that may require repairs to an earthen structure.

Total costs for implementation of this alternative would be approximately $549,897 plus $23,400 annual mowing and hazardous tree assessment costs.

(Treatment A is not applicable.)

Alternative 5

Treatment D: Annual hazard tree assessment at all 11 fortifications would cost approximately $2,000/year. Costs associated with annual removal of hazardous trees at all sites that have hazardous trees in year 2001 are in excess of $37,510. Some windthrow and mortality of trees may still occur that may require repairs to an earthen structure.

Total costs for *initial* implementation of this alternative would be in excess of $37,510 plus $2,000 annual hazardous tree assessment .

(Treatments A, B and C are not applicable.)

Mitigation

Although no adverse effects to cultural resources are anticipated from implementation of any of the action alternatives, it may be appropriate in some instances for archeological monitoring to accompany vegetation removal and trail construction. If archeological

resources are uncovered, work would be suspended in that location until the resources are adequately identified, assessed for significance, and appropriate treatment or mitigation is implemented in consultation with the State Historic Preservation Office. Designs for trails and observation platforms would be sensitive to the particular requirements of the individual fortification location so that historic features are not disturbed, and settings and viewsheds compatible with the historic scene are retained. Use of resource sensitive management practices include:

- installing erosion and sediment control devices;
- using small vehicles with low pressure tires;
- using soft logging techniques;
- hydroseeding or mulching;
- immediate seeding of bare soils;
- using sod or jute on steep sideslopes.

Using these techniques during tree removal would reduce or eliminate impacts to soils, air, and water resources. Use of the NPS integrated pest management practices regarding herbicide use will be followed.

Conclusions

The continuation of current management practices (Alternative 1) has the potential for indirect adverse effects on significant structural features and archeological resources associated with the various fortifications. While the park would continue to monitor resource conditions and carry out measures to reduce impacts from windthrown trees and other disturbances, it would more likely be in the position of having to reactively respond to resource threats and crisis situations rather than undertake more proactive resource management. Most importantly, interpretive opportunities would remain limited particularly for the densely forested Fishhook fortifications.

Implementation of the various action alternatives (Alternatives 2 through 5) would provide greater assurances that significant resources are preserved and protected by means of tree removal, grass seeding/erosion control, and ongoing maintenance activities. Interpretive opportunities to provide visitors with greater understanding of the scale, configuration, and interrelationship of the fortifications would also be significantly enhanced (except Alternative 5). Greater degrees of tree/vegetation clearing would present correspondingly expanded interpretive opportunities (i.e, Alternatives 2-4). Using resource sensitive management practices such as erosion control measures and immediate application of appropriate seed mixtures, all action alternatives would be expected to have little to no adverse effect on cultural and natural resources. While consensus has not been reached among earthwork management professionals on the vegetative cover type that best protects earthen structures for perpetuity, **complete tree removal (Treatment B) offers the greatest protection from tree windthrow, while lesser degrees of protection are offered by removal of only large trees (Treatment C) or removal of only hazard trees (Treatment D).**

The preferred alternative (alternative #4) in this environmental assessment:

1. **provides the most favorable landscape for historical interpretation of Petersburg National Battlefield;**
2. **eliminates tree windthrow and tree mortality damage to the historic earthen structures;**
3. **provides erosion protection through grass cover to the fortifications;**
4. **enhances maintainability of the sites through more efficient mowing techniques;**
5. **enhances the condition and appearance of the fortifications;**
6. **improves visitor accessibility, and**
7. **increases safety of visitors and staff;**

Cumulative Impacts

Tree removal may result in slight increases in sedimentation and soil erosion in the short term that would be minimized by using soft logging techniques and hydroseeding the sites shortly after tree removal. There would, however, be no significant impact to water

quality in streams within the Chesapeake Bay watershed. There will be changes in species composition.

In conjunction with past, present and reasonably foreseeable actions, implementation of any action alternative, would be expected to have beneficial effects on the interpretation and preservation of significant fortifications critical for the understanding of the siege of Petersburg. The actions would be in keeping with earthwork preservation strategies developed for other Civil War battlefield sites and would be adapted to the particular environmental and related requirements of the Petersburg area. While requiring a greater maintenance commitment to prevent the natural succession of trees and other vegetation from reappearing on the earthworks, the long-term preservation of the fortifications in a condition that furthers the park's legislative mandate would be attained.

Impairment

Impairment, as defined by the National Park Service, is an impact that in the professional judgement of the park manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Analysis of impairment considers each particular resource and value that may be affected; the severity, duration, and timing of the impact; and the direct and indirect cumulative effects of the impact.

The National Park Service has determined that the proposed action (Alternative 4) will not lead to an impairment of park resources and values. Relevant scientific studies, public comments and other sources of information were used to analyze the alternatives. It was found that impacts, but not impairment, to the visitor experience would occur in the short term from all of the action alternatives (i.e., Alternatives 2-5). The cutting and removal of trees, which is proposed under each of these alternatives, would cause visual and auditory intrusions into the visitor observations of the historic scene at these sites. In addition, access to the sites would be restricted during these activities, which limits the visitor's experience. These unavoidable impacts would be temporary and would occur only during project implementation.

Impacts to water resources and wildlife and vegetation would also occur for those alternatives that recommend removal of trees and other vegetation. Some soil loss could also occur during the tree and stump removal operations. Nonetheless, impairment to the park's resources would not occur since only a small percentage of park forested land, and associated plants and wildlife would be affected. There would be little impacts to the park's earthworks and archeological resources for all but the No Action Alternative.

In the long term, impairment would occur only if the No Action Alternative (Alternative 1) were implemented. This would result from continued structural degradation of the fortifications and archeological resources as trees uproot through windthrow and displace large quantities of soil.

Table 4. Environmental Consequences Summary for Five Alternatives Proposed for the Preservation of Earthen Fortifications at Petersburg National Battlefield

Impact Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Fortifications	Continued structural degradation from windthrown trees	Eliminates tree windthrow damage at Main Unit sites and Forts Conahey and Fisher Reduces tree windthrow damage at Battery 27, Forts Urmston, Welch, Gregg, and Wheaton	Eliminates tree windthrow damage at Main Unit sites and Forts Conahey and Fisher Reduces tree windthrow damage at Battery 27, Forts Urmston, Welch, Gregg and Wheaton	Eliminates tree windthrow damage at Main Unit sites and five Fishhook sites Reduces tree windthrow at Forts Urmston and Gregg	Slightly reduces tree windthrow damage at all sites
Archeological Resources	Continued exposure where windthrown trees uproot at ALL 11 forts	Continued exposure where windthrown trees uproot at six (6) forts	Continued exposure where windthrown trees uproot at six (6) forts	Continued exposure where windthrown trees uproot is reduced to only two (2) forts: Urmston and Gregg	Continued exposure where windthrown trees uproot at ALL 11 forts
Vegetation	Grass with a few large trees - Main Unit sites Forest - Fishhook sites	Grass – Main Unit sites and Forts Conahey and Fisher Trees <12” dbh left at Battery 27, Forts Welch, Gregg, and Wheaton Forest - Fort Urmston	Grass – Main Unit sites and Forts Conahey and Fisher Forest - Battery 27, Forts Urmston, Welch, Gregg, and Wheaton	Grass – Main Unit sites and five Fishhook sites Forest - Forts Urmston and Gregg	Grass with a few large trees - Main Unit sites Forest - Fishhook sites
Soils – **Short Term**	No change	Potential soil movement from complete tree removal throughout Main Unit sites (except Elliott’s Salient) and Forts Conahey and Fisher	Potential soil movement from complete tree removal throughout Main Unit sites (except Elliott’s Salient) and Forts Conahey and Fisher	Potential for soil movement from complete tree removal throughout Main Unit (except Elliott’s Salient) and five Fishhook sites	Potential limited soil movement from spot tree removal at all fortifications

Impact Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
		Potential limited soil movement from spot tree removal at Battery 27, Forts Friend, Haskell, Urmston, Welch, Gregg, and Wheaton and Salients Colquitt and Elliott	Potential limited soil movement from spot tree removal at Battery 27, Forts Friend, Haskell, Urmston, Welch, Gregg, and Wheaton and Salients Colquitt and Elliott	Potential limited soil movement from spot tree removal at Forts Friend, Haskell, Urmston and Gregg and Salients Colquitt and Elliott	
Soils – **Long Term**	Soils displace and erode where trees uproot	Grass cover reduces soil displacement and erosion at Main Unit sites and Forts Conahey and Fisher Tree cover reduces soil displacement and erosion at Battery 27, Forts Urmston, Welch, Gregg, and Wheaton. Soils may displace and erode if trees uproot.	Grass cover reduces soil displacement and erosion at Main Unit sites and Forts Conahey and Fisher Tree cover reduces soil displacement and erosion at Battery 27, Forts Urmston, Welch, Gregg, and Wheaton. Soils may displace and erode if trees uproot.	Grass cover reduces soil displacement and erosion at Main Unit and five Fishhook sites Tree cover reduces soil displacement and erosion at Forts Urmston and Gregg. Soils may displace and erode if trees uproot.	Tree cover reduces soil displacement and erosion at all fortifications. Soils may displace and erode if trees uproot.
Wildlife	Benefits forest dwelling animals sensitive to disturbance	Some benefit to grassland and early successional forest dwelling animals	Some benefit to grassland and mature forest dwelling animals	Most benefit to grassland dwelling animals	Benefits forest dwelling animals
Air Quality (Short Term)	No change	More dust released than Alternative 3	Less dust released than Alternative 2	More dust released than other alternatives	Less dust released than other action alternatives
Visual Access	Views blocked by trees, particularly at Fishhook sites	Views open at Main Unit sites and Forts Conahey and Fisher Views limited by large trees at Fort Urmston and	Views open at Main Unit sites and Forts Conahey and Fisher Views limited by large trees at Battery 27, Forts	Views open at Main Unit and five Fishhook sites Views limited by large trees at Forts Urmston	Views limited by large trees, particularly at Fishhook sites

Impact Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
		small trees at Battery 27, Forts Welch, Gregg, and Wheaton	Urmston, Welch, Gregg, and Wheaton	and Gregg	
Physical Access	Full access to and through four (4) Main Unit sites Limited access to Battery 27 and Forts Welch and Gregg No Access to Forts Urmston, Conahey, Fisher, Wheaton	Full access to and through four (4) Main Unit sites, Forts Fisher and Conahey Limited access to Battery 27 and Forts Welch and Gregg No Access to Forts Urmston, Wheaton	Full access to and through four (4) Main Unit sites, Forts Fisher and Conahey Limited access to Battery 27 and Forts Welch and Gregg No Access to Forts Urmston, Wheaton	Full access to and through nine (9) fortifications Limited access to Fort Gregg No access to Fort Urmston	Full access to and through four (4) Main Unit sites Limited access to Battery 27 and Forts Welch and Gregg No access to Forts Urmston, Conahey, Fisher, and Wheaton
COSTS					
Annual:					
Mowing	$ 15,000	$ 19,500	$ 19,500	$ 23,000	N/A
Repairs	$ 20,000	Less than Alt 3	More than Alt 2	Least Potential	Most Potential
Hazard Assessment	N/A	$ 150	$ 1,000	$ 400	$ 2,000
Tree Removal:					
Treatment B (one time)	N/A	$ 405,377	$ 405,377	$ 525,827	N/A
Treatment C (initial)	N/A	$ 99,816	$ 15,088	$ 15,088	N/A
Treatment D (initial)	N/A	$ 2,686	$ 13,300	$ 8,982	$37,510+

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Appendix 1

Interpretive Plan for Units of Eastern and Western Fronts Petersburg National Battlefield.

As expressed in the **Introduction** of the *Environmental Assessment for the Preservation of Civil War Earthen Fortifications at Petersburg* the Petersburg Campaign was a long and drawn out affair. Unlike many other battlefields associated with the Civil War, which are characterized by relatively brief moments of climatic battle followed by disengagement, the actions and battles encompassing the nine and a half month Petersburg Campaign represent 108 actions. Of these actions, which includes assaults, skirmishes, reconnaissance raids, etc., 16 have been identified by the Civil War Sites Advisory Commission as nationally significant battles. The actions and battles associated with the Petersburg Campaign represent a fundamental shift in the strategy and tactics of the Union army and this shift was decisive in ultimately closing this unfortunate chapter in American history.

The Petersburg Campaign resulted from General Grant's continual shift of the Union left flank in order to extend General Lee's Confederates to their right. Through this effort the Union forces were able to cut off greatly needed supply lines for the Confederates and constantly reducing the already limited number of troops defending an ever broadening defensive front. Because of the nature of the Petersburg Campaign the legibility of the historic landscape is critical for visitor comprehension of: the massive scale and scope of the campaign; the strategic advantages, disadvantages, and interdependent relationship between different fortifications within a complex network of trenches, batteries, and forts; the proximity of opposing lines, the defensibility of positions, and the vulnerability of troops within those lines; and the contrasting complexity and simplicity of engineering for trench warfare.

In order for the visitor to gain an appreciation and understanding for the events that took place at Petersburg National Battlefield, and for visitors to make important connections with the historic landscape it is imperative that the National Park Service provide viable and compelling interpretive experiences at these sites. The primary objectives of the interpretive program at Petersburg is to convey the horror of this event in American history in a way that provokes the visitor to ponder the notions of patriotism, bravery, suffering, and life itself, to provide the visitor an understanding for the magnitude of the event relative to the nation as well as the individual soldier in the trench; to foster a sense of stewardship for the preservation of historic places which reflect the heritage of this nation. In order to accomplish these objectives the interpretation at Petersburg National Battlefield will discuss the raw statistics and tactical aspects of the campaign in terms of the human lives engaged. Using the abundance of 1st person accounts and descriptions the interpreters will take the visitor on a journey through abstract days of the past using the eyes and voices of the soldier with the goal of having the visitor ponder the relevancy of this event, of the not so distant past, to their lives today and tomorrow.

At present the visitor experience at these sites are compromised by the following circumstances: 1) the visual integrity of the site and visitor accessibility (to varying degrees both intellectual and physical) of the site is obstructed by forest growth; 2) there is inadequate interpretive signage, guides and/or personal programming to provide visitors an understanding for the events that took place on these sites.

The Division of Interpretation is presently involved in the development of a *Long Range Interpretive Plan* that identifies visitor experience goals, interpretive themes and objectives for the park. This plan is responsive to the draft *General Management Plan* and recognizes the important role each site plays in telling the stories associated with the Petersburg Campaign. In order to adequately interpret the sites associated with the Petersburg Campaign the following interpretive treatments are necessary.

Eastern Front Sites

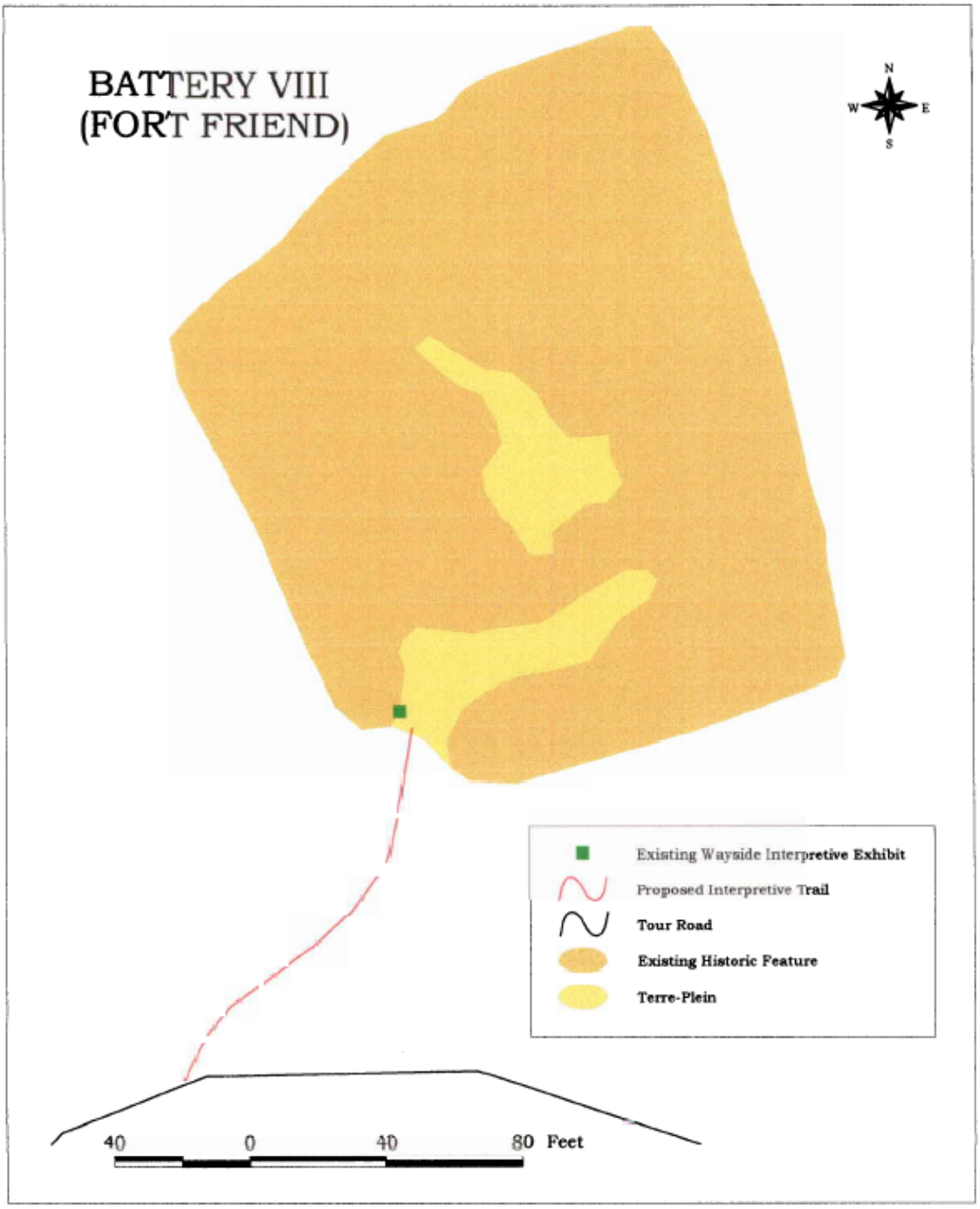
The Eastern Front of Petersburg was the section of the Petersburg Front that witnessed hostilities throughout the nine and a half months of the campaign. The Union initial assault took place on June 15, 1864 and Lee attempted to break the siege on March 25, 1865. Lee's attack on Fort Stedman on March 25, 1865 would be Lee's last offensive of the war. One week later the Confederates in the lines at Petersburg would succumb to an all out Union assault. Between June 15, 1864 and April 3, 1865 the Eastern Front would be characterized by the closeness of the opposing lines, continual harassment between the lines, and desperate ill-fated attempts to breach each other's lines. The distinction that this battlefield landscape has far and beyond any other civil war landscape is the closeness of the opposing lines, the stories associated with the continual engagement of the two armies for such a long duration, and the aggregate effect on the landscape as a result of prolonged warfare on a stagnant front.

Fort Friend

Fort Friend was known as Battery #8 when part of the Confederate Dimmock Line. On the initial Union assault for Petersburg this portion of the Confederate line was captured by U.S. Colored Troops and converted to a Union fortification. There is presently a trail leading from the parking lot to a wayside exhibit located outside the fort and continues to within the fort. Inside the fort is a howitzer, which appears to be the visitor's primary destination. Social trails have been created within the fort and on top of the works. There is no interpretive advantage of visitor entering the fort.

The following actions are recommended:

- Remove the howitzer from the fort to the front side of the fort near the existing wayside
- Relocate the wayside exhibit so as the historic photograph in the exhibit is in alignment with the howitzer and the works shown in the photo.
- Remove the trail evidence within the fort.


BATTERY VIII
(FORT FRIEND)
N
W
E
S
Existing Wayside Interpretive Exhibit
Proposed Interpretive Trail
Tour Road
Existing Historic Feature
Terre-Plein
40
0
40
80 Feet

Colquitt's Salient

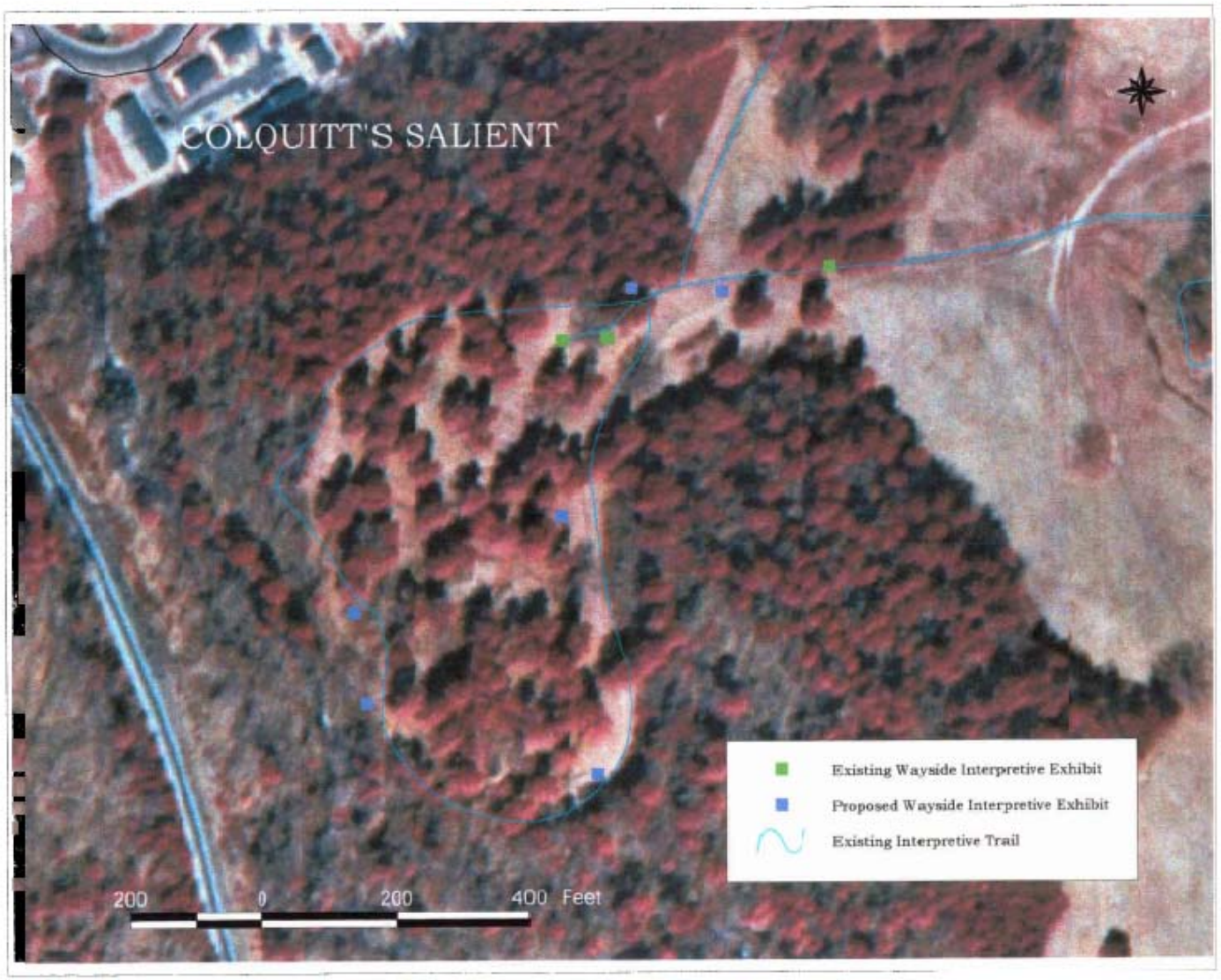
Colquitt's Salient is perhaps one of the most significant sites in the park and ranks highly as a grossly under-interpreted site. Colquitt's Salient was the focal point for the main assault of the Union army on June 18, 1864. Following the initial assault on Petersburg the Union forces constructed forts within extremely close proximity to the Confederate lines. The relationship between the Confederate positions at Colquitt's Salient and Gracie's Salient and the Union positions at Fort Stedman and Fort Haskell provides the most vivid understanding for the relationship and interdependency of the fortifications located on the Eastern Front as well as the intensity that existed along the front throughout the nine and a half month campaign. From Colquitt's Salient General Lee launched a desperate attack on the Union position at Fort Stedman on March 25, 1865 in an attempt to break the Union line and the siege. The dramatic, though unsuccessful, battle between these positions would be General Lee's last offensive of the Civil War.

Until recently the view shed between the Colquitt's Salient and Fort Stedman had been obscured by forest growth. Recent thinning of the trees and under-story has revealed the relationship of these two positions and has greatly improved the interpretability of the sites. However, the remaining forest cover and ground vegetation prevents the visitor from seeing Gracie's Salient and Fort Haskell from Colquitt's Salient and the visitor is unable to understand the relationship between the four forts during the campaign or the battle of March 25. Presently the trail leads visitors to the front side of Colquitt's without affording them the opportunity to view the site from the rear. The historic rear view photographs of Colquitt's Salient review one of the most abysmal living conditions of the war.

The following actions are recommended:

- Extend the trail system around exterior of Colquitt's Salient
- Replace the orientation wayside exhibit
- Install a wayside exhibit at the Prince George Court House Road trace to interpret the initial assault
- Install a wayside exhibit at the Hare House site to interpret impacts on civilian life
- Install a wayside exhibit to interpret the 1st Maine assault and monument
- Remove the existing wayside exhibits, stone monument and the Napoleon at the front of Colquitt's Salient
- Install a wayside exhibit on the new trail to the right front side of Colquitt's Salient to interpret the shift from assault to siege
- Install the stone monument and a wayside exhibit along the new trail in the rear of Colquitt's Salient to interpret life in the Confederate lines
- Install a wayside exhibit along the new trail to the right rear of Colquitt' s Salient to interpret the troop build up and preparations for the March 25 assault
- Install a wayside exhibit along the new trail to the left front of Colquitt's Salient to interpret the importance of terrain and the advantage of the creek
- Remove the stone monument to Gracie's Salient
- Install Napoleon to the front center of Colquitt's Salient and install a wayside to interpret the plan of attack on March 25

- Install wayside exhibit along trail to Fort Stedman to interpret the attack on Fort Stedman and the repulse from Fort Stedman and Fort Haskell
- Install low profile wayside exhibit with confederate soldier quote concerning the assault
- Install low profile wayside exhibit with union soldier quote concerning the assault
- Install a wayside exhibit at Fort Stedman to interpret the aftermath of Lee's last offensive


COLQUITT'S SALIENT
Existing Wayside Interpretive Exhibit
Proposed Wayside Interpretive Exhibit
Existing Interpretive Trail
200
0
200
400 Feet

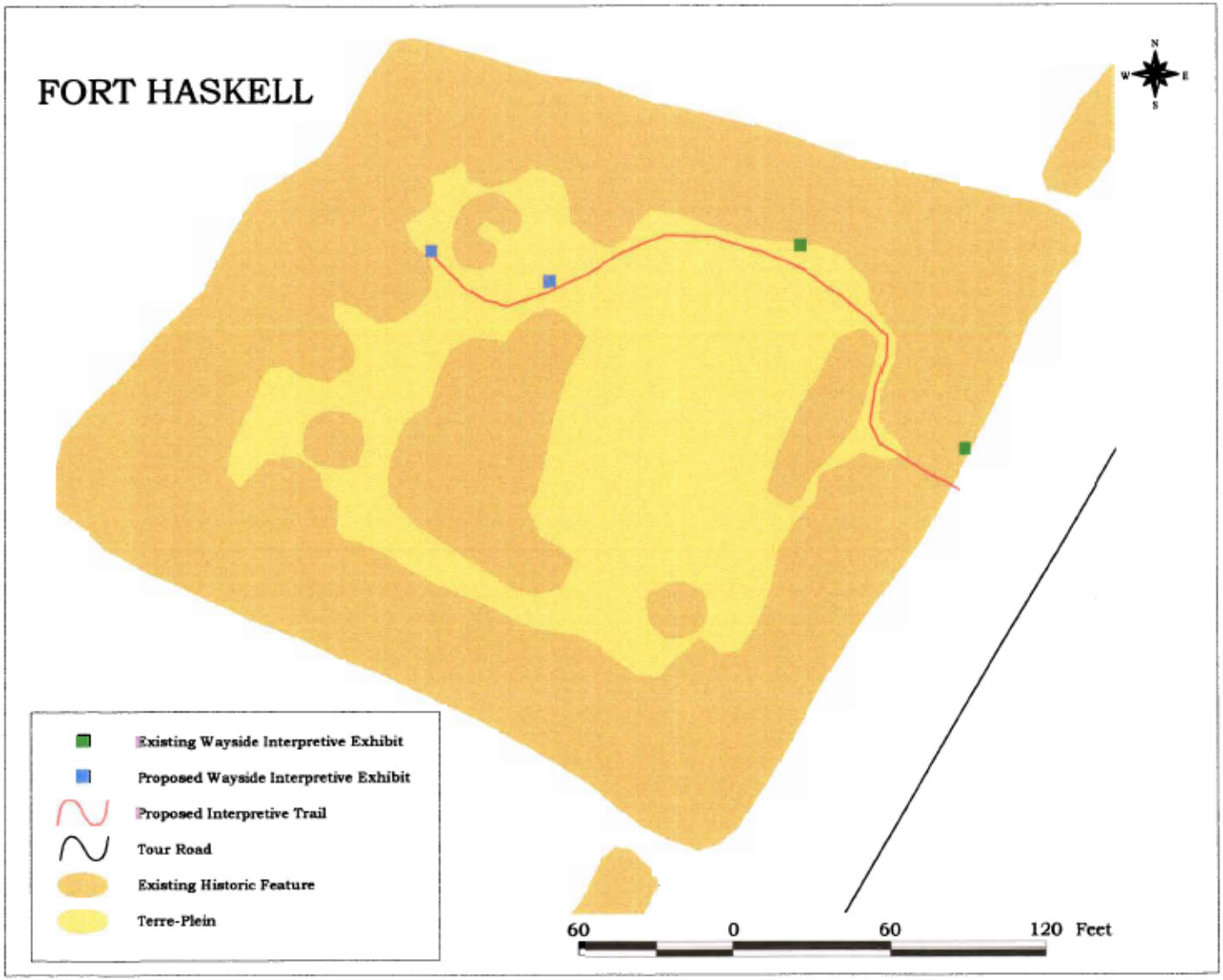
Fort Haskell

Fort Haskell was positioned directly opposite to Gracie's Salient, able to provide harassment fire to Colquitt's Salient and offer direct support for Fort Stedman. During Lee's assault of March 25, after Fort Stedman temporarily fell to Confederate hands the artillery from Fort Haskell was instrumental in repulsing the Confederate attack and supporting the Union
counter-attack.

From Fort Haskell today trees and ground vegetation prevent any views of Gracie's Salient, Colquitt's Salient or the landscape immediately in front of the fort. Consequently the visitor to this site is not afforded a view that represents the landscape as it existed in 1865 or the ability to understand the relationship of this fort to the other forts associated with Lee's assault.

The following actions are recommended:

- Improve existing trail and extend to the North West end of the fort
- Install new low profile wayside at fort entrance asking visitor to protect the earthworks
- Retain existing wayside exhibit which interprets the repulse of Confederates on March 25
- Retain two Napoleons and install another to reflect the three guns in the fort at the time of the assault
- Install new wayside along extended trail to interpret the principle (pre-battle) location of the guns and their relationship to the magazines and bomb proofs

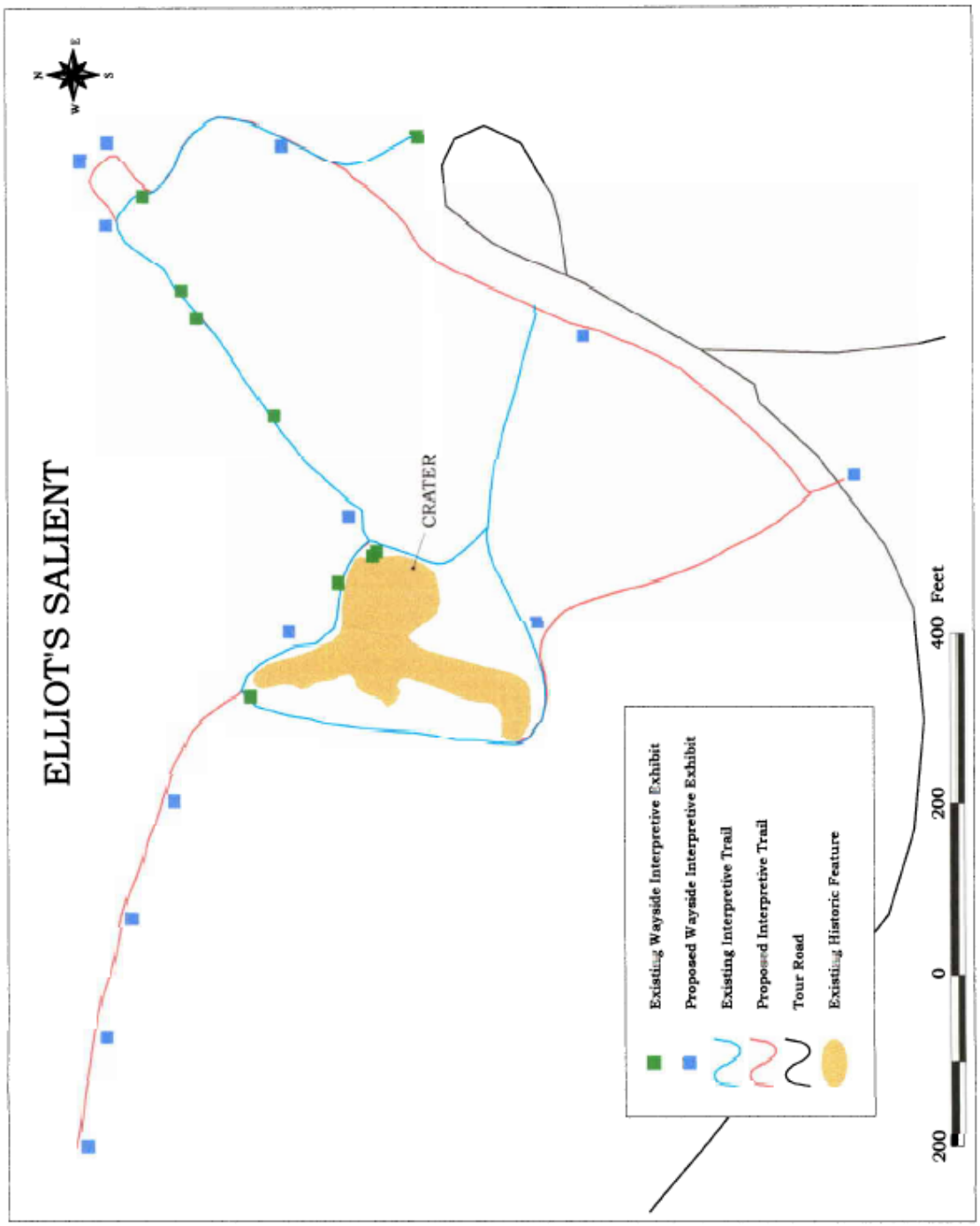

FORT HASKELL
N
W
E
S
Existing Wayside Interpretive Exhibit
Proposed Wayside Interpretive Exhibit
Proposed Interpretive Trail
Tour Road
Existing Historic Feature
Terre-Plein
60
0
60
120
Feet

Elliott's Salient

Elliott's Salient has become one of the icons of Petersburg National Battlefield because of the drama that played out at this portion of the Confederate line on July 30, 1864 when a Union mine was exploded at daybreak causing an immense crater and creating havoc along the Confederate line. Though the incident ranks as one of the greatest blunders in U.S. military history, it resulted in no tactical or strategic advantage for the Union. The heroic counter attack of Confederate General Mahone, and the resulting evidence of the explosion, the Battle of the Crater was the site most chosen at Petersburg by veterans for memorials and ceremonies and still remains to be the primary destination point for most visitors to the park.

The following actions are recommended:

- Install orientation exhibit at the parking to interpret the relationship of this site to the initial assault of June 18
- Install wayside exhibit along new trail to interpret the soldier frustration of the shift from battle to siege
- Install wayside exhibit along new trail to interpret the plan concerning the mine and the attack
- Remove exhibit overlooking mine entrance, install new exhibit concerning terrain and the ability to construct tunnel unobserved
- Install wayside exhibit on new platform interpreting the action digging of the mine tunnel
- Install wayside exhibit on new platform of the mine artwork (for accessibility purposes) showing the digging of the tunnel
- Install wayside exhibit on incline of trail toward Confederate line to interpret the notion of going over the top during the assault
- Install low profile wayside exhibit with soldier quote concerning the assault
- Install low profile wayside exhibit with soldier quote concerning the assault
- Move existing wayside exhibit back from The Crater (15')
- Install wayside exhibit to the right of The Crater to interpret the 4th Division assault and the story of the U.S.C.T.
- Install wayside exhibit at new trail to interpret Mahone's advance and preparation for the counterattack
- Install low profile wayside exhibit with soldier quote concerning the advance
- Install low profile wayside exhibit with soldier quote concerning the advance
- Install wayside exhibit at the end of the new trail to interpret the struggle to retake the Confederate works and repulsing the Union troops
- Install wayside exhibit to the left side of The Crater to interpret the final phase and aftermath of the battle
- Install wayside exhibit at the end of the trail (backside of orientation exhibit) to encourage visitors to proceed to the Western Front.


ELLIOT'S SALIENT
CRATER
Existing Wayside Interpretive Exhibit
Proposed Wayside Interpretive Exhibit
Existing Interpretive Trail
Proposed Interpretive Trail
Tour Road
Existing Historic Feature
200
0
200
400 Feet

Western Front Sites

The Western Front of Petersburg evolved throughout the campaign as a result of General Grant's continued effort to cut rail lines supplying the Confederates and to stretch General Lee's limited troops to cover an ever-broadening front. The Western Front is critical for visitor's understanding of Grant's overall strategy and the significant battles that took place to meet Grant's strategic goals. The Western Front reflects: the importance of supply lines and the defensive effectiveness of trench warfare. Through appropriate management and interpretive efforts our goal is that visitors to the Western Front can gain: an understanding for the placement and design of earthworks, the architecture of warfare, and an understanding for the importance of transportation, both defensively and offensively. The distinction that this battlefield landscape has far and beyond any other civil war landscapes is its ability to convey the scale of the campaign, to showcase architecture of fortifications, and to tell the story of the Confederacy's ultimate fate when Grant's strategy proved effective in the final assaults of April 2, 1865. Like the Eastern Front, through physical and visual accessibility, and the employment of effective interpretation many stories can be told through the voices of the soldiers engaged.

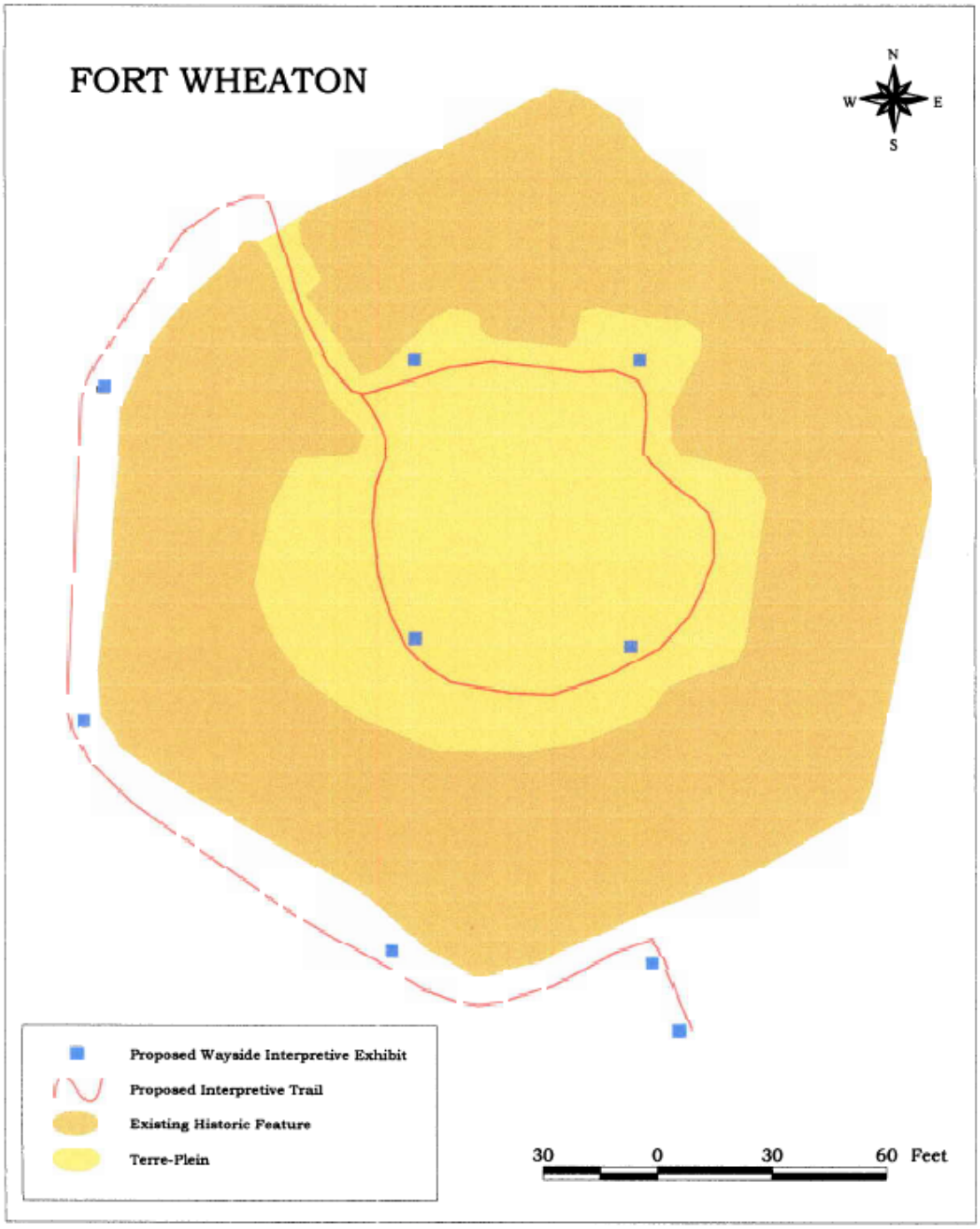
Fort (Archer) Wheaton

Fort Archer was constructed by Confederate troops in August of 1864 and served as the western most outpost protecting the routes to Boydton Plank Road and the South Side Railroad. Following the Battle of Weldon Railroad and the establishment of Union Fort Wadsworth, the Union push to extend its flank and continue to close off supply routes resulted in the Battle of Peebles Farm. On the first day of the three day Battle of Peebles' Farm Fort Archer was captured by Union forces. The fort was reconfigured to serve as a Union defensive position and renamed Fort Wheaton. There are several components to this resource that make it an important interpretive experience: the place it holds in the chronology of significant events associated with the Petersburg Campaign, the dramatic role it played in the Battle of Peebles' Farm; the reconfiguration of the fort to Union purposes; and the interpretive value it holds in setting the stage for future events associated with the campaign.

Fort Wheaton is presently identified on the park map and brochure. However, because of accessibility issues (parking, vegetation cover, lack of interpretive opportunity) visitation to the fort is not encouraged. When the issues of visitor accessibility to the site are resolved it is recommended that visitor traffic through the Western Front be redefined to proceed as follows: Fort Wadsworth; to Poplar Grove Cemetery via Routes 676 and 675; to Fort Wheaton via Routes 675, 741, and 613; to Fort Urmston via 613, to Fort Conahey via 676, to Fort Fisher via 676. This routing would allow the visitor to follow the routes and the chronology of events as they occurred on the Western Front.

The following actions are recommended:

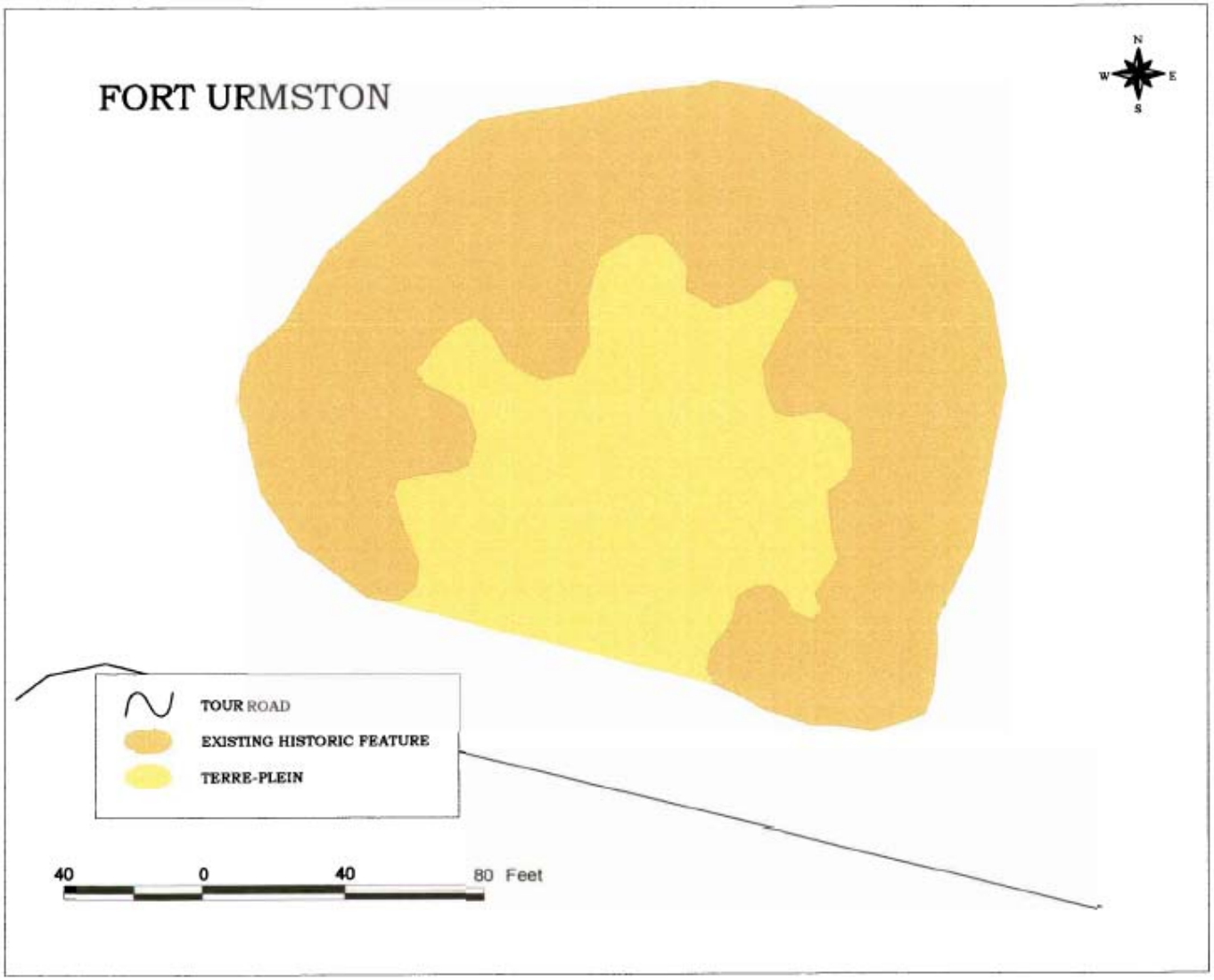
- Identify and obtain viable parking for visitors to approach the fort from the south
- Install orientation wayside that interprets the extension of the Union flank and the Battle of Peebles' Farm.
- Identify trail route to and through the fort
- Install wayside that interprets the importance of the position to the Confederate defenses
- Install wayside exhibit that interprets the first days Battle of Pebbles' Farm.
- Install low profile waysides using 1st person account
- Install low profile waysides using 1st person account
- Install low profile waysides using 1st person account
- Install low profile waysides using 1st person account
- Install wayside exhibit that interprets the reconfiguration of the fort
- Install wayside exhibit that interprets the consequences of the Battle of Pebbles' Farm


FORT WHEATON
N
W
E
S
Proposed Wayside Interpretive Exhibit
Proposed Interpretive Trail
Existing Historic Feature
Terre-Plein
30
0
30
60 Feet

Fort Urmston

The Battle of Weldon Railroad (August 18-21, 1864) resulted in extending the Union right flank and capturing a vital rail line to Petersburg. Grant continued to push west and on September 29 Union troops assaulted the Confederate lines in what would become a three day engagement known as the Battle of Peeble's Farm. Fort Urmston represents the right flank of the newly gained ground. However, fighting on this ground occurred on the second day of the battle. The introduction of the Battle of Peeble's Farm would be less confusing to the visitor if it were presented in chronological order and this story is best told from Fort Wheaton that lies west of this site.

Because of the lack of any unique architectural significance to the site and a desire to tell the Battle of Pebble's Farm story from better vantage points, there is no recommendation for interpretive development at Fort Urmston.


FORT URMSTON
N
W
E
S
TOUR ROAD
EXISTING HISTORIC FEATURE
TERRE-PLEIN
40
0
40
80 Feet

Fort Conahey

Fort Conahey is another fortification that resulted from the extension of the Union lines following the Battle of Peeble's Farm. The primary interpretive value of this fort is the interpretation of the fort's architecture. Fort Conahey is unique because it had two levels of gun emplacements. This story is also reflective of a measurable difference in the life of the soldier on the Western Front from that of his counterpart on the Eastern Front. In this section the opposing lines were a mile or more apart and experienced intermittent harassment, as opposed to the close quarters and constant harassment of the Eastern Front. This difference afforded much more luxury in living conditions and time. This is reflected in the personal accounts of the soldiers on the Western Front as well in the design of the fortifications. Fort Conahey is a unique representative of this difference.

Another important story associated with Fort Conahey is that of battlefield protection. The integrity of the surrounding area has been grossly compromised by the recent construction, adjacent and within sight, of a large steel reprocessing plant. The intrusions are visual and audible. A major objective of the interpretive program at Petersburg is to foster stewardship for park and battlefield preservation.

The following actions are recommended:

- Install an orientation wayside for Fort Conahey that interprets the fort's role in the extension of the Union line on the Western Front.
- Formalize the social trails in the fort
- Install a wayside exhibit that interprets the forts unique architecture
- Install a wayside exhibit that stresses the need and fosters public support for battlefield preservation

FORT CONAHEY
N
E
S
W
Existing Wayside Interpretive Exhibit
Proposed Wayside Interpretive Exhibit
Proposed Interpretive Trail
Tour Road
Existing Historic Feature
Terre-Plein
40
0
40
80 Feet

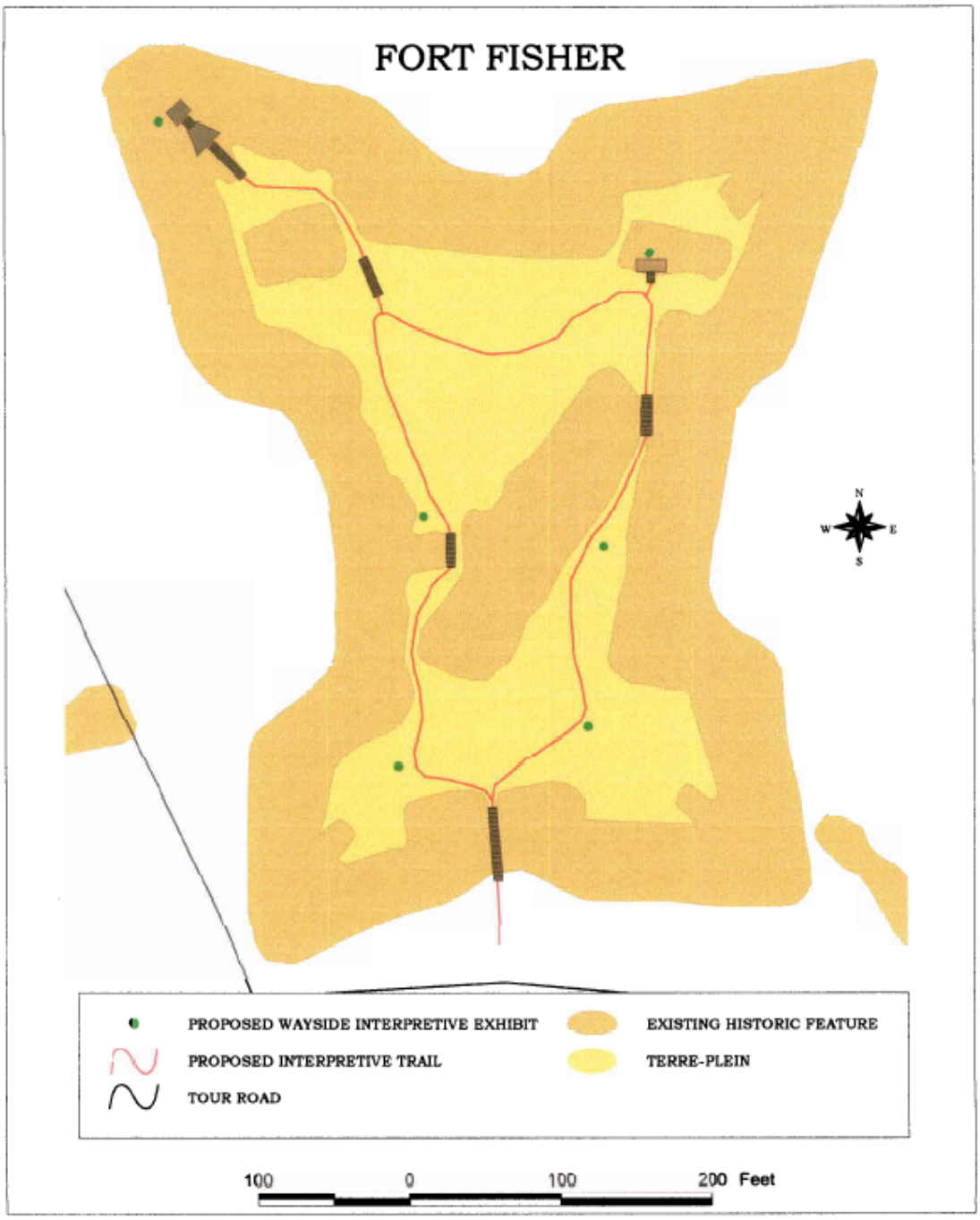
Fort Fisher

After the Battle of Peebles' Farm the Union forces constructed Fort Fisher. The original fort
was much smaller than the present fort. At the time of the reconfiguration of Fort Fisher (March 1865) it became the largest of the fortifications built during the Petersburg Campaign. On April 2, 1865 the Union forces launched the assault on the Confederate defenses. The success of this and other assaults along the Confederate line led to the evacuation of Petersburg and Richmond, and resulted in the Confederate Army of Northern Virginia's retreat toward Appomattox. Fort Fisher is the best fortification for the interpretation of fort architecture and engineering. The fort presently has no defined entrance or trails and because of the trees and vegetation the interpretive experience is greatly hindered. Features such as the parapets, bastions, bomb proofs, magazines, drainage features are still easily identifiable.

There is presently one wayside in the parking lot. The only other interpretive treatment this fort has received over the years has been occasional personal services programs during anniversary celebrations. The objective of interpretation is to dramatically increase the interpretive personal and non-personal experience at Fort Fisher. The objectives for interpretation are to provide visitors an understanding for the two major battles associated with this fort (the second day of the Battle of Peebles' Farm and the April 2, 1865 assault). Because of the integrity of the fort, this would serve as a primary resource for interpreting fortification design and the dramatic difference for the soldier's life between the Eastern Front and Western Front.

The following actions are recommended:

- Install an orientation wayside at the parking lot interpreting the second day of the Battle of Peebles' Farm, the extension of the Union left flank, and the continuation of the siege
- Formalize an entrance and trail system within the fort
- Install a wayside interpreting the construction of the fort
- Install a wayside interpreting life within the fort
- Install a wayside interpreting visible fort features and the defensive nature of the fort and the position along the Union line
- Install a wayside interpreting the capture of the Confederate picket line on March 25, 1865 and the final assault of April 2, 1865
- Install a wayside interpreting the drainage system within and outside the fort as a mater of complexity in fort design.
- Install a wayside interpreting the continuation of the Union left flank and fortifications and their role in significantly extending the Confederate line to a point of vulnerability


FORT FISHER
N
W
E
S
PROPOSED WAYSIDE INTERPRETIVE EXHIBIT
PROPOSED INTERPRETIVE TRAIL
TOUR ROAD
EXISTING HISTORIC FEATURE
TERRE-PLEIN
100
0
100
200 Feet

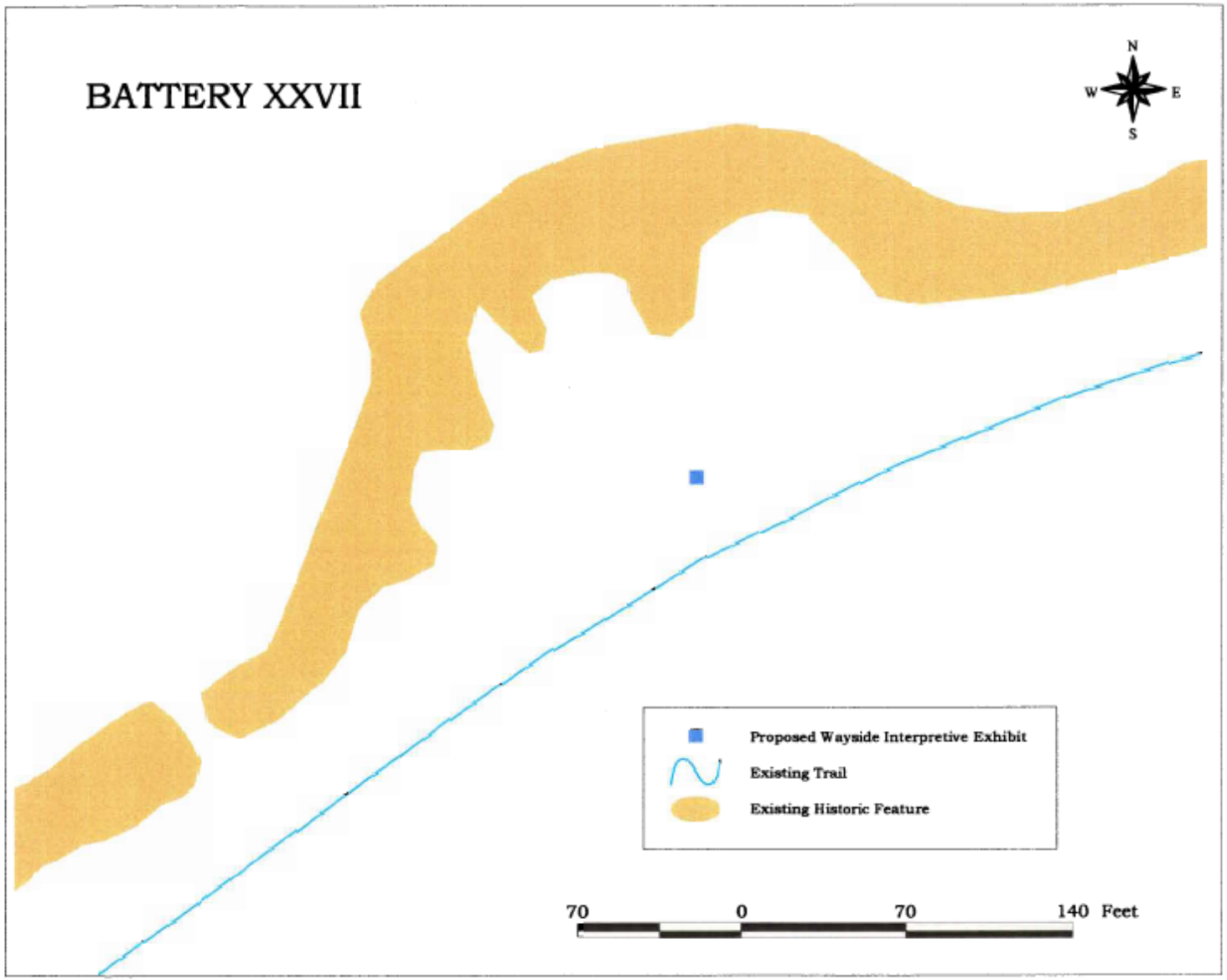
Battery 27, Fort Welch, Fort Gregg (Union)

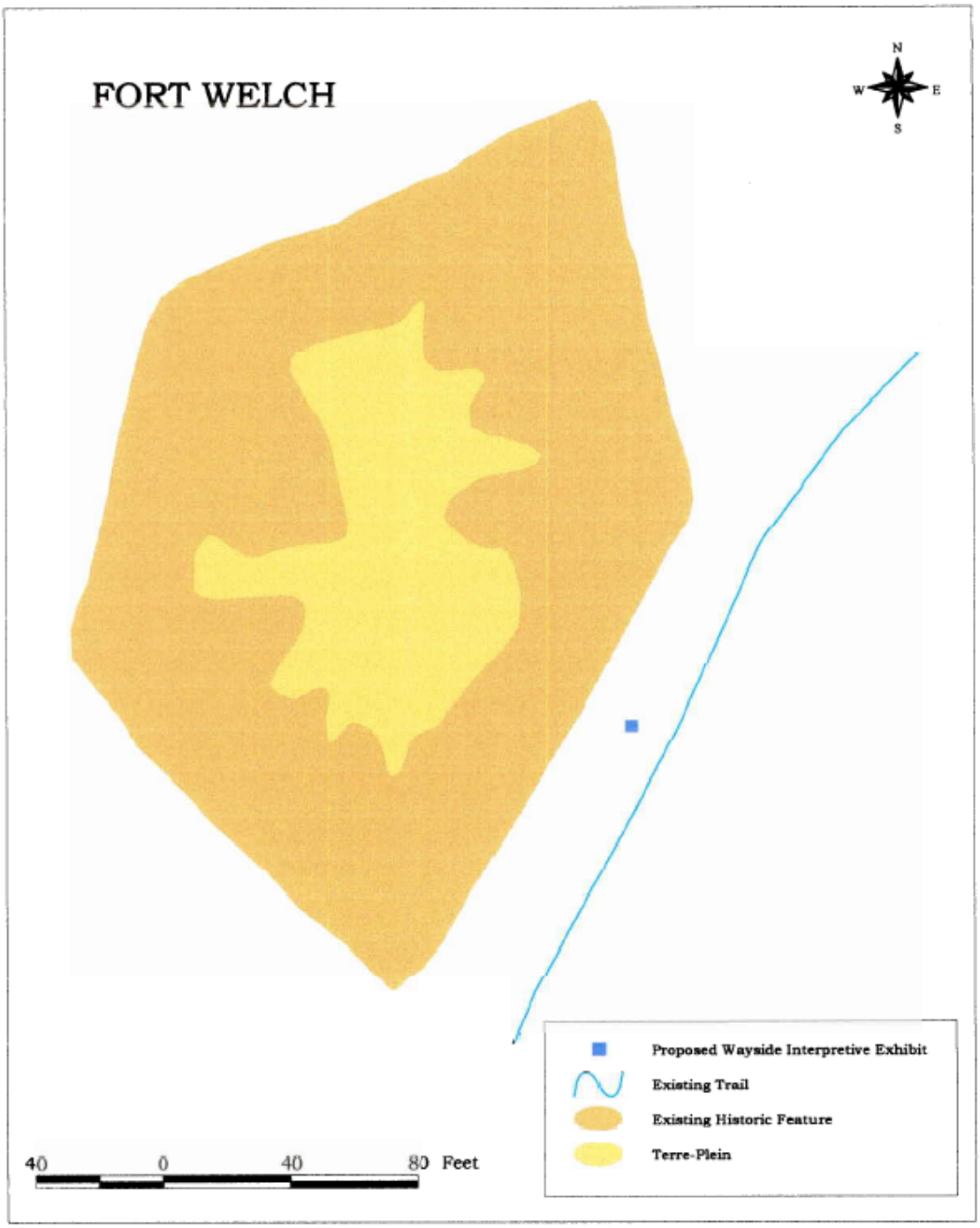
Following the Battle of Peebles' Farm the Union army continued to extend its flank to the west. In order to further protect Union left flank Battery 27, Fort Welch, and Fort Gregg were constructed. Because of the configuration of fortifications this section of the Union line has become commonly referenced to administratively as the "Fishhook", however, no contemporary references of this name have need noted.

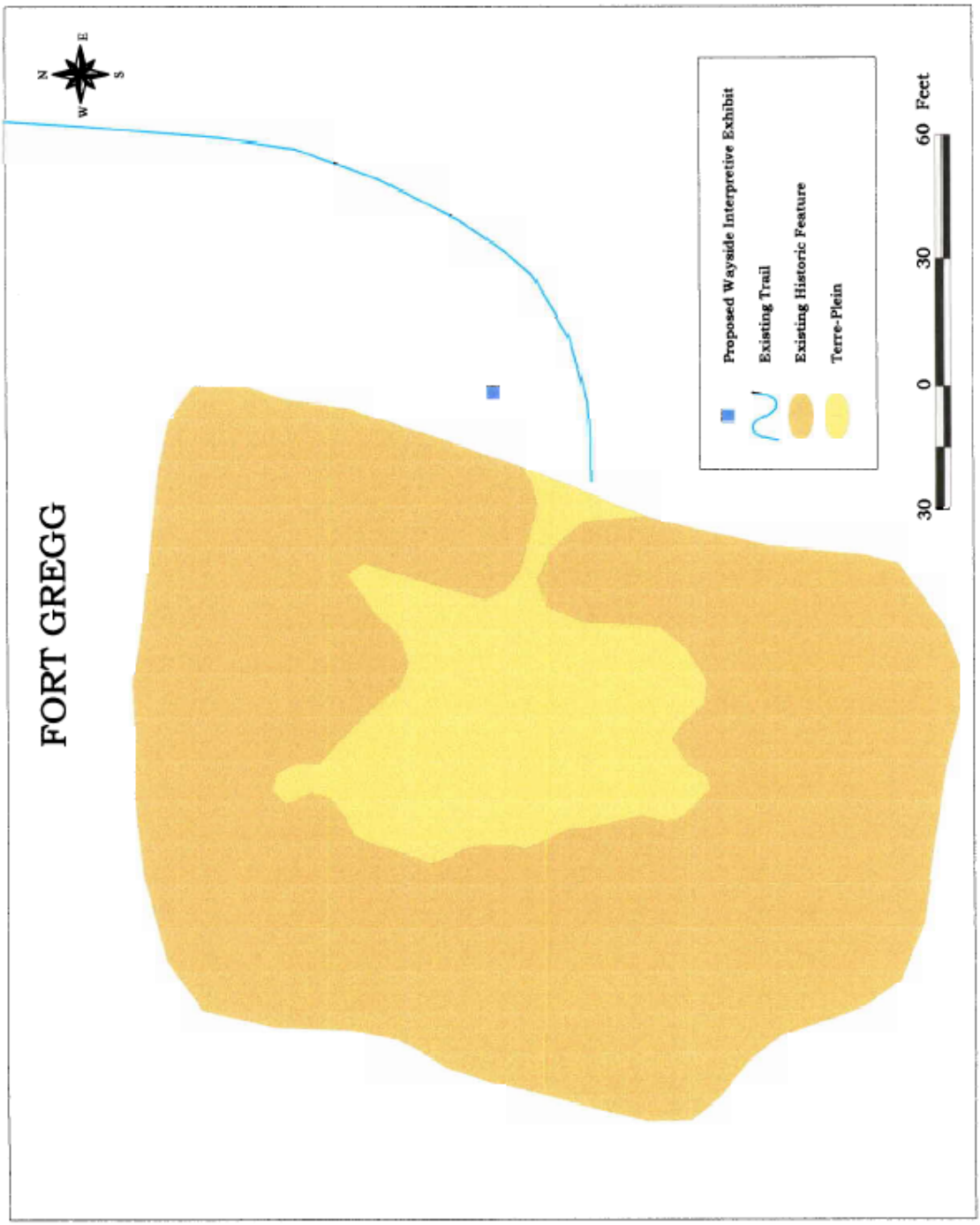
There is presently no road access to these positions but visitors can reach these site by way of an old service road trace. This road trace is located across Route 672 from Fort Fisher. Because of their location and means of access these site are relatively remote and offer a unique visitor experience. Visitors to these sites would find themselves on a much more exploratory venture than in other areas in the park. It is our recommendation that this element of the visitor experience be preserved and that interpretive development for these sites be minimal.

The following actions are recommended:

- Install orientation wayside at the beginning of the road trace
- Install a wayside at Battery 27 interpreting the difference in the open fortification and its ability to defend frontal attacks
- Install a wayside at Fort Welch interpreting the pentagon shape and its importance for defending this portion of the line
- Install a wayside at Fort Gregg interpreting the hexagonal shape in defending the left flank of the Union line


BATTERY XXVII
N
W
E
S
Proposed Wayside Interpretive Exhibit
Existing Trail
Existing Historic Feature
70
0
70
140 Feet


FORT WELCH
N
W
E
S
Proposed Wayside Interpretive Exhibit
Existing Trail
Existing Historic Feature
Terre-Plein
40
0
40
80 Feet


FORT GREGG
N
E
S
W
Proposed Wayside Interpretive Exhibit
Existing Trail
Existing Historic Feature
Terre-Plein
30
0
30
60 Feet

Appendix 2

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

David G. Brickley
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION
217 Governor Street, 3rd Floor
TDD (804) 786-2121 Richmond, Virginia 23219 (804) 786-7951 FAX (804) 371-2674
http://www.state.va.us/~dcr/vaher.html

October 29, 1999

Dave Shockley
Petersburg National Battlefield
1539 Hickory Hill Road
Petersburg, VA 23803

Re: Tree removal from earthworks

Dear Mr. Shockley:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

From 1989 to 1991, DCR conducted an inventory for natural heritage resources in and near eight Mid-Atlantic Regiona national parks including Petersburg National Battlefield. Natural heritage resources were not documented during the inventory. I spoke with Mr. Chris Ludwig, DCR's Chief Biologist, about the need for additional surveys. He indicated that another survey is not necessary at this time but that a comprehensive inventory should be conducted every twelve to fifteen years.

New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

Lesa S. Berlinghoff

Lesa S. Berlinghoff
Project Review Coordinator

An Agency of the Natural Resources Secretariat

Appendix 3

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October 21, 1999

U.S. Army Corps of Engineers
Norfolk District, Southern Virginia Regulatory Section
Southside Field Office
Nottoway, Virginia 23955

Project Number: 99-F0448

Waterway: Harrison Creek

1. Participant:
Petersburg National Battlefield Park
Post Office Box 549
Petersburg, Virginia 23804

2. Authorized Agent:
None

3. Address of Job Site:
Fort Friend, Colquitt Salient, Fort Haskell, Fort Conahey, Fort Fisher, Battery #27, Fort Welch, Fort Gregg, Fort Wheaton, as identified within Petersburg National Battlefield Park, Petersburg, Virginia.

4. Project Description:
Jurisdictional determination for the purpose of preserving and protecting the historical earthworks and associated moats listed above.

5. Findings

This is in reference to your application for a jurisdictional determination to perform the work as described in part 4 above.

The proposed work does not fall within the Corps of Engineers' jurisdiction. No permit will be required from this office, because no jurisdictional waters or wetlands were found within the subject areas. Please note that you should obtain all required State and local authorizations before you proceed with the project.

6. Corps Contact: Mr. Edward Graham

(For)
Mr. R. Harold Jones
Chief, Southern Virginia Regulatory Section

NAO FL 13 REVISED DEC 90